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# Family Economics and Nutrition Review

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# Relationship of Knowledge of Food Group Servings Recommendations to Food Group Consumption

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The USDA Food Guide provides recommended numbers of servings of five major food groups: (1) bread, cereal, rice, and pasta; (2) vegetables; (3) fruit; (4) milk, yogurt, and cheese; and (5) meat, poultry, fish, dry beans, eggs, and nuts. The objective of this study was to examine the relationship of knowledge of recommended servings of the five major food groups to reported food group consumption among female adult meal planners using data from the 1990 and 1991 Continuing Survey of Food Intakes by Individuals and Diet and Health Knowledge Survey conducted by the U.S. Department of Agriculture. Because about 99 percent of Diet and Health Knowledge Survey respondents gave incorrect responses for grain products, the effects of correct information on consumption of this group could not be analyzed. For the remaining four food groups studied, knowledge of serving recommendations was significantly associated with food group consumption after controlling for the effects of a number of other factors that may influence food consumption behavior. Results provide support for the use of a food guide-based approach to dietary guidance.

**T**

he science of nutrition attempts to answer the question, "What should we eat to be healthy?"

That question can be addressed on two levels: the scientific level and the consumer level. At the scientific level, recommended amounts of essential nutrients and other dietary components have been established by expert groups, such as the National Academy of Sciences (19,20). Consumers, however, choose foods rather than nutrients. To aid

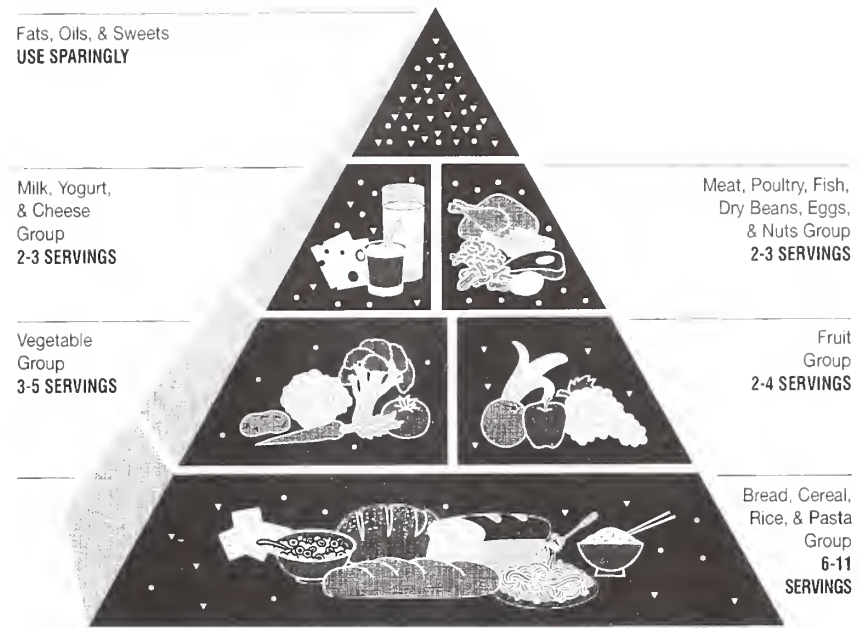
consumers in selecting a healthful diet, nutritionists have traditionally provided guidance in terms of food choices. A food guide translates recommendations on intakes of nutrients and other dietary components into recommendations for food consumption, with the goal of making nutrition advice understandable and usable to consumers.

The U.S. Department of Agriculture (USDA) published its first food guide for the general public in 1916. As

scientific knowledge increased, USDA developed new food guides to accommodate new information on nutrition needs (34). In 1985, USDA published its current food guide (30). To develop this guide, USDA used criteria based on the Recommended Dietary Allowances established by the National Academy of Sciences (21) and the Dietary Guidelines for Americans—the official statement of Federal dietary guidance policy published by the USDA and the U.S. Department of Health and Human Services (32). The overall goal of the USDA Food Guide is to offer consumers guidance on planning a total diet that would be both adequate in essential nutrients and moderate in food components for which excess intakes are associated with health risk (e.g., fat, saturated fatty acids, cholesterol, sodium, and sugars).

The USDA Food Guide provides recommended numbers of servings to be consumed each day from each of the five major food groups. For the bread, cereal, rice, and pasta group (called the “grain group” in this article, for brevity), 6 to 11 servings per day are recommended. Three to 5 servings from the vegetable group and 2 to 4 servings from the fruit group are recommended. For the milk, yogurt, and cheese group (“milk group”), 2 to 3 servings are recommended. The recommendation for the meat, poultry, fish, dry beans, eggs, and nuts group (“meat and beans group”) is 2 to 3 servings per day or the amounts of these foods that would be equivalent to a total of 5 to 7 ounces of cooked lean meat, poultry, or fish daily. In addition, the USDA Food Guide recommends moderation in consumption of fats, oils, sweets, and sodium.

**Figure 1. The Food Guide Pyramid: A guide to daily choices**



Source: U.S. Department of Agriculture and U.S. Department of Health and Human Services.

The USDA Food Guide was used in several USDA educational publications during the 1980's and was included in the 1990 edition of the Dietary Guidelines for Americans. It gained further prominence in 1992 with the release of the Food Guide Pyramid (fig. 1), a new graphic representation of the Food Guide (31). After consumer testing, this graphic was selected because it was found to be an effective visual image for communicating the information contained in the Food Guide (6,35). Since its publication, it has been widely disseminated not only as part of USDA publications but also as part of many educational and promotional materials developed by other public and private sector groups (35).

Given that so much emphasis has been placed on the use of food guides for nutrition education, it would be useful to know to what extent a knowledge of food guide recommendations is associated with actual food choices. Results of some studies provide evidence that knowledge of food group recommendations is associated with eating a healthier diet. Butler and Raymond (7) found that low-income consumers who were able to name the four food groups defined by the “Basic 4” food guide developed by USDA in 1956 (34) had better diets than those who could not. Several evaluation studies have shown the Expanded Food and Nutrition Education Program (EFNEP), a nutrition education program for low-income consumers that uses a food-group-oriented approach to

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teaching nutrition, to be effective in improving the diets of participants (2,28). EFNEP, however, also teaches other knowledge and skills, such as food shopping and preparation, that may also contribute to its success. Most recently, in a longitudinal study of Australian consumers, Smith et al. (25) found knowledge of the Australian food guide to be a significant predictor of the consumers' likelihood of making positive dietary changes following a nutrition education program.

The objective of this study was to examine the relationship of knowledge of recommended servings of major food groups to their reported consumption among female meal planners using data from the USDA's 1990-91 Continuing Survey of Food Intakes by Individuals (CSFII) and Diet and Health Knowledge Survey (DHKS). These surveys are unique in that, together, they provide the only federally collected data set capable of relating knowledge and attitudes concerning diet and health to actual dietary intake.

## **Methods**

### **Data and Sample**

The CSFII was designed to obtain a nationally representative sample of households in the 48 conterminous United States and consists of an all-income and a low-income sample. For the all-income sample, all households, including low-income households, were eligible to be interviewed. For the low-income sample, participation was limited to individuals in households with gross income for the previous month at or below 130 percent of the Federal poverty thresholds (29).

For the 1990-91 CSFII, trained interviewers visited each household and obtained socioeconomic and demographic data on households and their members. Health-related information, such as heights and weights of household members, was also collected. Heights and weights were self-reported; self-reported weights may be slightly underestimated, especially among overweight individuals (22). In addition, the interviewers obtained 1 day of dietary intake data, using the 24-hour recall method, and household members were asked to complete a record of foods consumed on the 2 days following the 24-hour recall. Thus, up to 3 consecutive days of food consumption information was obtained from household members.

For the DHKS, one member of each CSFII household was contacted about 6 weeks after dietary data were collected. Ideally, the individual contacted was the person who had identified himself or herself as the household's main meal planner/preparer. In some cases, interviewers were unable to contact the main meal planner/preparer, and about 6 percent of DHKS respondents were not the main meal planner/preparer. Most interviews were conducted by telephone; in-person interviews were conducted when this was not feasible.

DHKS respondents were asked a series of questions on their knowledge, attitudes, and practices related to diet and health. One series of questions assessed knowledge of food group recommendations. DHKS respondents were asked to state how many servings of (1) fruit; (2) vegetables; (3) dairy products; (4) grain products; and (5) meat, poultry, or fish

a person should eat daily (fig. 2).<sup>1</sup> Interviewers provided information on sample serving amounts. For this analysis, answers were coded as “correct,” “above correct answer,” or “below correct answer,” based on USDA Food Guide recommendations. Any answer within the recommended range was acceptable. For example, for the fruit group, 2 to 4 servings are recommended; therefore responses of “2”, “3”, and “4” were all considered correct.

In 1990 and 1991, DHKS and 3-day food intake data were obtained from 2,960 respondents. From these, female meal planners 18 years of age and over were selected as the sample for this analysis. The male DHKS respondents were excluded because of the considerable difference in male and female energy intakes. The small number of female DHKS respondents who were not meal planners were excluded because nonmeal planners might have less control over their food choices than meal planners. Pregnant and lactating women were excluded because their physiological state might be expected to create short-term changes in dietary requirements and food consumption. Women who consumed food products not typical of a mixed diet of a healthy adult, for example, medical nutritional products and baby foods, also were excluded. The final analysis data set consisted of 2,174 women.

To adjust for oversampling of low-income households and for differing response rates among population subgroups, DHKS sample weights were developed by USDA in cooperation with Iowa State University (29). Use

<sup>1</sup> Although the question does not specify all foods that are included in the meat, poultry, fish, dry beans, eggs, and nuts group, the analysis examines consumption of all foods in this group.

**Figure 2. Survey question assessing knowledge of food group recommendations**

Let’s begin by talking about your opinion of the amount of food, such as fruits, vegetables and meats that people should eat each day for good health. How many servings of (READ ITEM) should a person eat each day if one serving equals (READ AMOUNT)?

ITEM	AMOUNT	NUMBER OF SERVINGS
a. Fruit	One piece of whole fruit?	_____
b. Vegetables	A half cup of cooked vegetables?	_____
c. Dairy products	One cup of milk or a slice of cheese?	_____
d. Grain products	One slice of bread or a half cup of cooked cereal, rice, or pasta?	_____
e. Meat, poultry or fish	A piece the size of a medium hamburger?	_____

of these weights for descriptive statistics is recommended, so that the weighted sample will resemble more closely the actual U.S. population (15); weighted data were used in this study to calculate all descriptive statistics.

**Food Group Consumption Measures**

The CSFII reports food intakes in grams. Intakes were converted to serving amounts as defined by the USDA Food Guide using a data base previously developed (14). The servings designated for the USDA Food Guide were used to determine the number of servings or part of a serving represented in 100 grams of each food reported as eaten in the 1989-1991 CSFII. For grains, a serving size was one slice of bread or equivalent; for vegetables and fruit, 1/2 cup of a chopped, cooked, or canned

item or equivalent; and for milk products, 1 cup of milk or equivalent. For meat, poultry, fish, dry beans, eggs, and nuts, serving units were calculated in terms of 1 ounce of lean meat or equivalent.<sup>2</sup> In the case of mixed foods (for example, a cheese and tomato sandwich), the food was disaggregated and the contribution of each food ingredient to a major food group was estimated. That is, the contribution of a serving of a cheese and tomato sandwich to the

<sup>2</sup>One ounce or equivalent was selected as the unit of measurement for the meat and beans group because the USDA advises consumers to monitor daily intake of this group by estimating consumption of each food in the group in terms of equivalence to 1 ounce of cooked lean meat (for example, 1/2 cup of cooked dry beans is considered equivalent to 1 ounce of cooked lean meat). The number of ounces or equivalent consumed in a day should be totaled and compared to the recommendation of 5-7 ounces of cooked lean meat or equivalent per day (32).

grain, vegetable, and milk groups would be estimated. All contributions to the five major food groups were counted, including contributions from condiments and incidental ingredients (for example, the raisins in raisin bread would be counted toward fruit intake, even though the food is primarily a grain). Thus, "number of servings consumed" as defined in this paper, refers to the total amount of a given food group consumed, expressed in terms of USDA Food Guide serving sizes.

### **Analysis of Association of Knowledge of Food Group Recommendations with Food Group Consumption**

Mean food group intakes and total energy intakes by meal planners who reported the correct number of food group servings were compared to food group and energy intakes of other meal planners. For this analysis, weighted data were used and statistical tests were conducted using the SUDAAN software package, which accounts for the effects of the complex design of the CSFII-DHKS surveys (23). T-tests were used for comparing means of two groups, and multiple contrasts were used for simultaneously comparing means of three groups.

Besides knowledge of serving recommendations, many factors can affect food intake. Therefore, multivariate analysis techniques were used to examine the independent association of knowledge of serving recommendations with consumption of foods from the fruit, vegetables, meat and beans, and milk groups. (Because about 99 percent of respondents gave incorrect responses to the question on recommended servings of grain products, analysis of the effects of correct information was not undertaken for this group.)

For the other four groups, we examined to what extent food group serving consumption was explained by knowledge of serving recommendations while controlling for the effects of other factors that previous research indicated may influence food intake. The following factors were included in each model as control variables: Age, race, the height and body mass index<sup>3</sup> of the individual, household income<sup>4</sup> as a percent of the Federal poverty level, education, whether the individual was on a weight-loss diet, region of residence, urbanization, season in which dietary intake was reported, whether weekend intake was included in the 3-day dietary data, whether there were any days of reported intake in which the meal planner reported her food consumption to be unusually low, and whether there were any days of reported intake in which the meal planner reported her food consumption to be unusually high.

Age, race, household income, and education were included because previous research indicated that they are associated with differences in consumption of particular food groups, such as fruits, vegetables, and milk and milk products (3,4,9,10). Region of residence was included because it may influence availability and price of some food items, as well as local food preferences.

<sup>3</sup>Body mass index was calculated as the ratio of self-reported weight in kilograms to the square of self-reported height in meters. These values were calculated by the U.S. Department of Agriculture, Agricultural Research Service and are available on the data tape (29).

<sup>4</sup>Household income before taxes; includes household income from wages or salary, Social Security or Supplemental Security, pension or retirement, unemployment or workmen's compensation, alimony, child support, public assistance not including food stamps or WIC benefits, and any other sources of income (29).

Urbanization may be associated with availability; for example, central city areas may have fewer and smaller supermarkets, with less food selection (33). Season in which dietary intake was reported may influence price and availability, particularly for fruits and vegetables. Inclusion of a variable assessing weekend food intake should control for day-to-day variation associated with weekend versus weekday eating patterns.

Finally, differences in total energy intake can have an important influence on food group intake. Unfortunately, the use of energy intake as an independent variable in a multivariate equation is problematic because within-individual variability in energy intake introduces error that will produce biased coefficients (use of an intake variable such as food group consumption as a dependent variable does not create bias because within-individual variability is subsumed into the error term) (5). Therefore, several variables that proxy differences in energy need were used as control variables. These include self-reported height and body mass index, as calculated from self-reported height and weight, since larger individuals are likely to consume more energy; being on a weight-loss diet; and whether individuals reported any days with either lower-than-usual or higher-than-usual dietary intakes. In addition, age influences energy needs and controls for energy differences to some extent.

For the vegetable, milk, and meat and beans groups, ordinary least squares regression was used. For the vegetable and the meat and bean groups, knowledge of correct serving recommendations was entered into the equation as

a dichotomous variable with correct answers compared with incorrect answers below the recommendation. Because so few meal planners gave responses that were above the correct USDA Food Guide recommendation for either of these two groups, these individuals were excluded from the analysis. For the milk group, correct answers and answers above the correct recommendation were compared with answers below the correct recommendation. In accordance with guidelines for the use of USDA food consumption survey data (15), unweighted data were used for these multivariate analyses, and ordinary least squares regression analyses were conducted using the SPSS-X statistical software package (26).

For the fruit group, ordinary least squares regression analysis was not appropriate because of the large number of individuals ( $n=354$  or 16 percent of the sample) who did not consume any fruit at all over the 3-day period. In statistical terms, this means that the dependent

variable (servings of fruit consumed) cannot be considered a continuous variable throughout its range, but is instead limited at the zero point, and techniques appropriate for limited dependent variable analysis must be used (16). One technique that has been proposed as particularly suitable for analysis of food group consumption is the two-step analysis developed by Cragg (8,13).

The first step of this analysis (probit) identifies factors associated with the decision to consume fruit; the second step (truncated regression) identifies factors associated with quantity of fruit consumed, conditional on fruit being consumed. As with the vegetable group and the meat and beans group, the small number of meal planners who gave answers above the correct response were dropped from the analysis. Thus, the analysis compared those who gave "too low" responses and those who gave correct responses. The two-step analysis was conducted using the LIMDEP statistical package (11). Unweighted data were used in the analysis.

**Very few of the meal planners—only 1 percent—reported the correct number of servings from the grain group, while 99 percent gave responses that were below the recommended 6 to 11 servings.**

### Interpreting Regression Coefficients

For the ordinary least squares regression analyses used to examine consumption of the vegetable, meat and beans, and milk groups, estimated coefficients can be interpreted in terms of their independent effects on consumption. For example, if the estimated coefficient associated with knowledge of vegetable recommendations is 0.26, that can be interpreted as meaning that given knowledge of serving recommendations, an individual would consume 0.26 servings more of vegetables than an individual with equivalent personal characteristics who believed that a smaller-than-recommended number of vegetable servings should be consumed. The estimated coefficients produced by the two-step analysis used to examine fruit consumption cannot be interpreted in this manner. For this analysis, the reader should interpret a significant coefficient as indicating that a relationship exists between a given independent variable and fruit consumption, but the estimated coefficient cannot be directly used to determine the magnitude of that relationship.

## Results

### Description of Study Population

The average age of the meal planners was 49 (table 1). Average before-tax household income was \$35,218. Because meal planners came from households of varying size, income was also assessed as a percentage of the Federal poverty level, which accounts for household size. Average household income as a percentage of the Federal poverty level was 361 percent. Eighty-four percent of meal planners were white.

Most meal planners had at least a high school education. Twenty percent had not completed high school, whereas 37 percent were high school graduates, and 43 percent had at least some college education. Five percent were on a weight-loss diet. All regions of the country were represented in the study population, with 22 percent of meal planners coming from the Northeast, 24 percent from the Midwest, 35 percent from the South, and 19 percent from the West. A range of urbanization levels was also represented, with 30 percent of the study population from the central city, 47 percent from a suburban area, and 23 percent from a nonmetropolitan area.

To control for seasonal and day-of-week variation in intake, dietary data were collected from survey participants at all seasons of the year and on all days of the week. Approximately one-quarter of meal planners provided dietary data during each of the four seasons. For 57 percent of meal planners, the 3 days of dietary intake data included at least 1 weekend day; for the remainder, weekend dietary intake was not assessed. Dietary intake data can also be affected by fluctuations in day-to-day intake.

**Table 1. Description of sample<sup>1</sup>**

Variable	Mean	Range
Age (years)	49	18 - 97
Before-tax annual household income	\$35,218	\$500 - \$250,000
Annual household income as percent of Federal poverty level	361	6 - 3007
Body mass index (BMI)	25	14 - 63
Height (inches)	64	48 - 73
	<i>Frequency<sup>2</sup></i>	<i>(Percent)</i>
Race		
White	84	
Non-White	16	
Education		
Less than high school	20	
High school	37	
At least some college	43	
On weight loss diet		
Yes	5	
No	95	
Region of residence		
Northeast	22	
Midwest	24	
South	35	
West	19	
Urbanization		
Central city	30	
Suburban	47	
Nonmetropolitan	23	
Season intake reported		
Spring	25	
Summer	25	
Fall	24	
Winter	26	
Weekend day included in 3-day dietary data		
Yes	57	
No	43	
At least 1 day of lower than usual intake		
Yes	28	
No	72	
At least 1 day of higher than usual intake		
Yes	13	
No	87	

<sup>1</sup>n=2,174, weighted data.

<sup>2</sup>Valid percent for each variable.

Twenty-eight percent of meal planners stated that on at least 1 of the 3 days of dietary intake reported, they consumed less than they usually ate. Thirteen percent indicated that on at least 1 of the 3 days of dietary intake reported, they consumed more than they usually ate. Finally, amounts consumed can be affected by an individual's size. The meal planners averaged 64 inches (1.6 m) in height and a body mass index of 25.

### Knowledge of Food Group Servings Recommendations

The meal planners' knowledge of food group servings recommendations varied considerably by food group (table 2). Very few of the meal planners—only 1 percent—reported the correct number of servings from the grain group, while 99 percent gave responses that were below the recommended 6 to 11 servings. The majority—73 percent—provided correct responses for fruits, and 34 percent provided correct responses for vegetables. For the meat and beans group, 52 percent of meal planners provided correct responses.

Almost all of the incorrect responses for the fruit, vegetable, and meat and beans groups were below the correct recommendation. For these three food groups, only 1 to 2 percent of meal planners named amounts that were above recommendations. For the milk group, however, 12 percent of meal planners reported serving recommendations that were above the 2 to 3 servings recommended by the USDA Food Guide. Sixty percent of meal planners reported the correct recommendation, and 28 percent reported amounts that fell below recommendations.

**Table 2. Knowledge of food group servings recommendations of adult meal planners, CSFII/DHKS 1990-91, 3-day data set<sup>1,2</sup>**

Food group	Answer below correct recommendation	Answer correct according to USDA food guide	Answer above correct recommendation
	<i>Percent</i>		
Bread, cereal, rice, and pasta group	99	1	0
Fruit group	26	73	<1
Vegetable group	64	34	2
Milk, cheese, and yogurt group	28	60	12
Meat, poultry, fish, dried beans, eggs, and nuts group	46	52	2

<sup>1</sup>n=2,174, weighted data.

<sup>2</sup>Valid percent for each food group.

Based on their 3-day diet records, meal planners generally consumed smaller amounts of the five major food groups than are recommended by the USDA Food Guide. Food consumption data based on self-reports may be under-reported (17). Examination of total reported caloric intakes revealed mean intakes of 1,479 kilocalories for the meal planners, which is below the average energy allowance for adult women with light-to-moderate activity levels, as established by the National Academy of Sciences (20). It is possible, therefore, that these results may underestimate food group consumption.

### Food Group Intakes and Energy Intakes of Meal Planners

Table 3, p. 10, presents mean food group intakes and energy intakes of meal planners by knowledge of food group servings recommendations. Meal planners who reported the correct number of recommended servings of vegetables consumed significantly more servings of vegetables per day—2.9 servings, on average, compared with 2.5 servings consumed by those who gave answers below the correct recommendation. An average of 1.4 servings of fruit per day was consumed by those who reported the correct number of recommended servings of fruit, significantly more than the 1.0 servings averaged by those who gave answers below the correct recommendation.

**Table 3. Mean food group intakes and total caloric intakes by female meal planners, CSFII/DHKS 1990-91, 3-day data set<sup>1</sup>**

Reported number of recommended food group servings	Mean number of servings consumed per day				Meat, poultry, fish, dried beans, eggs, and nuts group
	Grain group	Vegetable group <sup>2</sup>	Fruit group	Milk group	
Below correct recommendation (Total caloric intake)	4.9 (1479)	2.5 <sup>L</sup> (1456)	1.0 <sup>L</sup> (1446)	1.1 <sup>L,H</sup> (1414)	4.4 oz. or equivalent (1462)
Correct (Total caloric intake)	—	2.9 (1506)	1.4 (1491)	1.4 <sup>H</sup> (1467)	4.5 oz. or equivalent (1490)
Above correct recommendation (Total caloric intake)	—	—	—	1.8 (1699) <sup>E</sup>	—

<sup>1</sup>n=2,174, weighted data.

<sup>2</sup>Does not include legumes.

— Indicates too few respondents for reliable estimates.

L=Food group intake significantly lower than that of women with correct answers.

H=Food group intake significantly higher than that of women who gave answers above correct recommendation.

E=Energy significantly higher than that of women who gave correct answers and answers below correct recommendation.

For the meat and beans group, those who provided a correct response to the question on number of servings consumed an average of 4.5 ounces of cooked lean meat, poultry, fish or the equivalent, compared with 4.4 ounces consumed by meal planners who gave answers below the correct recommendation; this difference was not significant. Meal planners who provided correct answers to the questions on recommended servings for the vegetable, fruit, and meat and beans groups averaged higher caloric intakes than those who provided answers below the correct recommendation, but the difference was not significant.

So few meal planners provided correct responses to the question on recommended servings of grains that average intakes for the “correct answer” group cannot be reliably estimated. The meal planners who provided answers below the correct recommendation, however, averaged 4.9 servings of foods from the grain group.

For the milk group, meal planners who reported the correct number of recommended servings consumed 1.4 servings, whereas those who gave answers below the correct recommendation consumed 1.1 servings. The meal planners who gave answers that were higher than the USDA Food Guide recommendation

consumed 1.8 servings per day. All three of the groups differed significantly from each other in terms of milk group servings consumed. Meal planners who gave answers below the correct recommendation had caloric intakes that were 53 calories lower, on average, than the intakes of those who gave the correct answer, but this difference was not significant. Meal planners who gave answers that were higher than the USDA Food Guide recommendation had average caloric intakes that were significantly higher than the caloric intakes of meal planners who gave answers that were either correct or below recommendations.

### Association of Knowledge of Food Group Recommendations With Food Group Consumption

For all four food groups studied, knowledge of food group serving recommendations was found to be positively associated with consumption of the corresponding food group after controlling for the other factors included in the multivariate analyses. Several of these other factors also influenced consumption of particular food groups, although none influenced food group consumption as consistently as did knowledge of serving recommendations. Regression models used to examine consumption of the vegetable, meat and beans, and milk groups explained 8 to 10 percent of variance, similar to results of other analyses using personal characteristics to explain differences in consumption as assessed by national food consumption survey data (18).

For the vegetable group (table 4), knowledge of the correct number of recommended servings was significantly associated with increased consumption of servings of vegetables. In addition, vegetable consumption was positively associated with age, household income, having at least some college education, and living in the Northeast or Western regions as compared with living in the South. It was negatively associated with living in a central city area, as compared with living in a suburban area, and having at least 1 day of lower than usual reported dietary intake.

**Table 4. OLS regression coefficients for factors related to number of vegetable servings per day, CSFII/DHKS 1990-91, 3-day data set<sup>1</sup>**

Independent variable	Estimated coefficients
Knowledge of correct number of vegetable servings (base = Answer below correct recommendation)	0.26*
Age	0.008*
Height	0.01
Body mass index	0.002
White (base = Non-White)	-0.007
Household income as percent of Federal poverty level	0.0008*
Education (base = No high school)	
High school	0.06
At least some college	0.25*
On weight loss diet (base = Not on weight loss diet)	-0.08
Region of residence (base = South)	
Northeast	0.56*
Midwest	0.13
West	0.22*
Urbanization (base = Suburban)	
City	-0.21*
Nonmetropolitan	0.08
Season intake reported (base = Winter)	
Spring	0.11
Summer	-0.04
Fall	-0.12
Weekend day included in 3-day report (base = No weekend day)	0.06
At least 1 day of lower than usual intake	-0.52*
At least 1 day of higher than usual intake	0.02
Constant	0.80
R <sup>2</sup>	0.10

\*p < .05.

<sup>1</sup>2,023 observations included in analysis.

For the fruit group (table 5), two-step analysis revealed that knowledge of the serving recommendation was not associated with the decision to consume fruit but was associated with the amount of fruit consumed. Variables that had a positive significant association with the decision to consume fruit were being older, being taller, having a higher household income, having at least some college education, and living in the Northeast or West compared with the South.

Besides knowledge of fruit servings recommendations, other variables that were positively associated with the amount of fruit consumed, conditional on the decision to consume fruit, were being older, having at least a high school education, and living in the Northeast compared with the South. Amount of fruit consumed was negatively associated with having a higher body mass index and having reported dietary intake during a period that included at least 1 weekend day.

Consumption of servings of foods from the meat and beans group was positively associated with knowledge of the serving recommendations for this group (table 6). For this food group, being older, being white rather than non-white, being on a weight-loss diet, and eating less than usual on at least 1 of the 3 days of reported dietary intake were all associated with lower numbers of servings consumed. Having a higher household income, a higher body mass index, a reported dietary intake during a period that included at least 1 weekend day, and living in the Northeast region were factors that were positively associated with intake of this food group.

**Table 5. Estimated coefficients for factors related to number of fruit group servings per day using two-step analysis, CSFII/DHKS 1990-91, 3-day data set<sup>1</sup>**

Independent variable	Estimated coefficients	
	Probit	Truncated regression
Knowledge of correct number of fruit servings (base = Answer below correct recommendation)	0.11	2.26*
Age	0.02*	0.10*
Height	0.03*	-0.005
Body mass index	-0.007	-0.08*
White (base = Non-White)	0.02	0.76
Household income as percent of Federal poverty level	0.0005*	0.001
Education (base = No high school)		
High school	0.14	1.15*
At least some college	0.43*	2.39*
On weight loss diet (base = Not on weight loss diet)	-0.08	1.09
Region of residence (base = South)		
Northeast	0.25*	1.42*
Midwest	0.10	0.19
West	0.30*	0.71
Urbanization (base = Suburban)		
City	-0.16	0.70
Nonmetropolitan	-0.08	0.32
Season intake reported (base = Winter)		
Spring	-0.03	-0.09
Summer	0.07	0.65
Fall	-0.15	-0.74
Weekend day included in 3-day report (base = No weekend day)	0.13	-0.93*
At least 1 day of lower than usual intake	-0.13	-0.81
At least 1 day of higher than usual intake	0.06	0.44
Constant	-2.53*	-12.99*
Log-likelihood	-858	-2211
Chi-square statistic	192*	

\*p < .05.

<sup>1</sup>2,032 cases included in analysis.

**Table 6. OLS regression coefficients for factors related to consumption of meat, poultry, fish, dried beans, eggs, and nuts<sup>1</sup> per day, CSFII/DHKS 1990-91, 3-day data set<sup>2</sup>**

Independent variable	Estimated coefficients
Reported number of recommended meat, poultry, fish servings (base = Answer below correct recommendation)	0.32*
Age	-0.01*
Height	0.01
Body mass index	0.02*
White (base = Non-White)	-0.70*
Household income as percent of Federal poverty level	0.001*
Education (base = No high school)	
High school	-0.05
At least some college	-0.16
On weight loss diet (base = Not on weight loss diet)	-0.76*
Region of residence (base = South)	
Northeast	0.29*
Midwest	0.0003
West	-0.21
Urbanization (base = Suburban)	
City	0.17
Nonmetropolitan	0.16
Season intake reported (base = Winter)	
Spring	0.22
Summer	0.11
Fall	-0.14
Weekend day included in 3-day report (base = No weekend day)	0.19*
At least 1 day of lower than usual intake	-0.70*
At least 1 day of higher than usual intake	0.26
Constant	3.80*
R <sup>2</sup>	0.09

\*p < .05.

<sup>1</sup>Expressed as ounces of cooked lean meat or equivalent.

<sup>2</sup>2,018 observations included in analysis.

For the milk group (table 7, p. 14), the relationship of knowledge to intake is somewhat more complex. Both knowledge of correct serving recommendations and belief that even higher numbers of servings from the milk group should be consumed were associated with consumption of significantly more servings from the milk group, compared with belief that fewer than two servings are recommended. However, the values of the estimated coefficients differ. For the correct answer, the value of the estimated coefficient is 0.31, indicating that given knowledge of the correct recommendations, the female meal planner will consume 0.31 more servings from the milk group than if she believed the recommendation to be lower, all other factors being equal.

For the answer above the correct recommendation, the estimated coefficient is 0.49, indicating that this belief is likely to lead to an increase in milk group consumption of 0.49 servings. Thus, belief that even more servings from the milk group should be consumed than are recommended by the USDA Food Guide leads to an even greater increase in milk group consumption than knowledge of the correct recommendations.

Several other factors also influenced milk group consumption. Being white rather than non-white was positively associated with consumption of this food group, as was having at least some college education, living in the Midwest region as compared with the South, and being taller. Having a higher body mass index, reporting food intake during the summer or fall months as compared with winter, and reporting at least 1 day of lower than usual intake were negatively associated with number of servings of milk and milk products consumed.

**Table 7. OLS regression coefficients for factors related to number of milk servings per day, CSFII/DHKS 1990-91, 3-day data set<sup>1</sup>**

Independent variable	Estimated coefficients
Reported number of recommended milk group servings (base = Answer below correct recommendation)	
Correct answer	0.31*
Answer above correct recommendation	0.49*
Age	-0.0004
Height	0.03*
Body mass index	-0.009*
White (base = Non-White)	0.34*
Household income as percent of Federal poverty level	-0.00003
Education (base = No high school)	
High school	0.08
At least some college	0.17*
On weight loss diet (base = Not on weight loss diet)	-0.02
Region of residence (base = South)	
Northeast	0.12
Midwest	0.12*
West	0.01
Urbanization (base = Suburban)	
City	0.03
Nonmetropolitan	-0.07
Season intake reported (base = Winter)	
Spring	-0.08
Summer	-0.19*
Fall	-0.14*
Weekend day included in 3-day report (base = No weekend day)	-0.04
At least 1 day of lower than usual intake	-0.15*
At least 1 day of higher than usual intake	0.11
Constant	-0.59
R <sup>2</sup>	0.08

\*p < .05.

<sup>1</sup>2,051 observations included in analysis.

## Conclusions

For all four major food groups analyzed, it was found that knowledge of USDA Food Guide servings recommendations was independently associated with food group consumption after controlling for a number of characteristics. For the fruit group, knowledge of serving recommendations was not associated with the decision to consume fruit but was associated with amount consumed. It may be that over a 3-day period individuals consume at least small amounts of fruit for a variety of reasons, for example as a small part of another food. Consumption of larger amounts, however, seems to be more likely when individuals know serving recommendations.

For the vegetable, fruit, and meat and bean groups, knowledge of correct recommendations was compared only with incorrect answers that were lower than the correct recommendation, since fewer than 3 percent of meal planners gave answers that were above recommendations for these food groups. Only for the milk group was there an appreciable number of meal planners who believed that even more servings than are recommended in the USDA Food Guide should be consumed.

Believing one should consume higher-than-recommended amounts of a given food group may encourage its intake, but it may also increase caloric intake or displace other food groups from the diet. The meal planners who believed they should consume higher-than-recommended amounts from the milk group did consume more milk and milk products than either those with correct or "too low" answers. They also consumed significantly more calories and did not consume smaller-than-average

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amounts of other food groups (data not shown). Their total caloric intake was 232 to 285 calories higher than that of women in other groups, much more than would typically be provided by 0.4 servings from the milk group. It appears that their increased consumption of milk and milk products was associated with a pattern of higher-than-average overall caloric intake rather than with displaced consumption of other foods.

The only one of the five major food groups for which an association between knowledge of USDA Food Guide recommendations and food group consumption could not be established was the grain group. Too few meal planners knew the recommended number of grain servings for it to be possible to analyze the effects of correct information on consumption of these foods. These data were collected before the publication of the Food Guide Pyramid graphic, which has given more publicity to USDA Food Guide recommendations. It may be that consumers are now more aware of recommendations for consumption of grains.

Data on knowledge of food group serving recommendations and food consumption are currently being collected as a part of USDA's 1994-96 Continuing Survey of Food Intakes by Individuals/Diet and Health Knowledge Survey. Comparison of the results obtained after release of the Food Guide Pyramid with the results obtained by this study will provide some information on the effectiveness of the Food Guide Pyramid in transmitting knowledge of recommended grain intake.

A major concern when examining the relationship of knowledge of recommendations to food group intake is the possible effect of confounding variables. One major variable of interest is energy intake. Individuals differ in energy intake, due to differences in size, activity level, etc. Individuals who consume more total energy (kilocalories) might be expected to consume larger amounts of food groups, regardless of knowledge. Therefore, several variables reflecting differences in energy intake were included in analyses as control variables. The significance of knowledge, after controlling for factors that would influence energy intake, lends more support to the conclusion that differences found are attributable to quality of food choices, not just quantity of food consumed.

Underreporting of energy intake might also affect identified relationships. Unfortunately, dietary data based on 3 days of reported intake cannot be used to categorize specific individuals as underreporters, since some reported low intakes may simply reflect day-to-day variation in intake. Overweight has been identified as being associated with underreporting (24). Body mass index was included in the analysis and was found to be significantly associated with decreased consumption of foods from the fruit group and the milk group and increased consumption of foods from the meat and beans group. These relationships may be associated with underreporting or with distinctive patterns of food consumption related to having a higher body mass index. Since it would be surprising for higher-weight individuals to underreport fruit and milk products but not foods from the meat and beans group, the latter explanation may be more probable.

Although many other factors were found to have significant impacts on individual food groups, knowledge of food group recommendations had the most consistent, significant, positive association with food group consumption of any of the factors included in the multivariate analyses. This supports the general usefulness of a food-group-based approach to nutrition education as a means of encouraging an overall healthful diet. At the same time, nutrition educators may want to consider the role other variables, such as household income, education, and place of residence, may play in consumption of particular food groups. For example, results of these analyses indicate that, when factors such as race and household income are controlled, living in a central city area is associated with decreased consumption of vegetables. Nutrition educators working with urban populations may wish to consider this finding and investigate any particular problems, such as access to stores stocking a variety of vegetables, that may need to be considered in developing a nutrition promotion program that would be effective in an urban population.

Despite the positive effects of knowledge, meal planners who knew USDA Food Guide serving recommendations did not, on average, consume the minimum number of servings in the recommended range. Although this result could reflect underreporting, it may also indicate further educational and motivational needs of consumers. Lack of knowledge of recommended serving sizes for each food group has been cited as a source of consumer confusion (1). Educational efforts that provide this information may assist consumers.

Other types of education that build on the basic message of the Food Guide may also increase its effectiveness (1).

These results provide some support for the importance of nutrition education efforts to teach food group servings recommendations to consumers. It may be that this simple information by itself can encourage consumption of major food groups. However, it is generally agreed that many other factors, such as attitudes toward food and health and lifestyle factors, also play important roles in influencing food-related behavior (12). It may be that knowledge of recommended servings, as used in this analysis, is a proxy for other variables, such as more positive attitudes toward following dietary guidance or more detailed nutrition knowledge. Further investigation of the relationship of nutrition knowledge to food group consumption is indicated.

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# Health Status Transitions of the Elderly, by Residential Location: 1984 to 1990

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Transitions in the health status and living arrangements of community-resident elderly persons are examined to determine whether declining health and changes in social support networks are likely to result in changes in living arrangements. The Longitudinal Study of Aging (LSOA) is used to follow a sample of elderly people 70 years and older over a 6-year interval. Results show that the level of disability at the baseline date (1984) affects health outcomes over time, with fewer of the initially nondisabled entering nursing homes or dying by 1990. The nonmetro elderly experienced a somewhat greater decline in health status over the 6-year interval than did the metro elderly. A smaller proportion of elderly persons initially living with their spouse end up in nursing homes or die 6 years later, compared with those initially living either alone or with others. The longitudinal data show that the risk of institutionalization is roughly the same for metro and nonmetro elderly. Elderly people adjust their living arrangements in response to changes in their health and social support networks.

**T**he growing number of older people in the United States, their greater risk of disability, and their higher use of health care services have increased the need for a more complete understanding of the nature of changes in health status later in life. This study uses the Longitudinal Study of Aging (LSOA) to follow a sample of elderly people 70 years and older living in the community in 1984 over a 6-year interval. Changes in health and disability are examined in relation to transitions in living arrangements and by metropolitan-nonmetropolitan (metro-nonmetro) residence. Understanding the relationship between changes in health status, living arrangements,

and residential location is essential to the allocation of health care and community resources and the future planning of appropriate health care services in local communities.

This study examines individual transitions both into and out of functionally impaired states. In order to have a better basis on which to plan interventions in functional loss in the elderly population, nationally representative estimates are needed of functional status transition rates specific by age, prior functional status, and residence. Longitudinal data make it possible to examine the 6-year incidence of functional limitations, the rates of improvement or loss of function

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for currently disabled persons, and the risks of institutionalization and mortality on the community-resident elderly population.

## Previous Research

Several studies have examined changes over time in the functional status of the elderly and the risk of institutionalization and death using the LSOA and other surveys (2,4,6,10,13). Manton found that the majority of elderly persons who were not initially disabled (about 82 percent) remained nondisabled over a 2-year period, and there was a significant probability of long-term improvement in functional status even at very high levels of impairment. Examining individual transitions both into and out of functionally impaired states, the level of disability was found to strongly predict differentials in mortality and risk of institutionalization; the higher the level of disability, the greater the risk of becoming institutionalized or dying.

Crimmins and Saito (4) found that the vast majority of older persons initially free of functioning difficulties remained that way over a 2-year period. Looking at both older people with difficulties in the initial period and those without difficulties, they found that less than 10 percent of those without functioning deficiencies at the first interview develop a deficiency. Older persons with a greater number of functioning difficulties at the baseline are less likely to improve in the interval. A much lower likelihood of improvement occurs in activities of daily living (ADL's) and instrumental activities of daily living (IADL's) with an onset duration greater than 1 year. Crimmins and Saito (4)

conclude that a return to functioning is most likely to occur where overall functional status is higher, loss is recent, and impairment is not severe, and that decline in each individual function is more likely to occur when general health and functioning levels are lower.

Health status was the best predictor of the living arrangements of older people 2 years later; elderly persons who had no difficulty performing personal care and home management tasks were more likely to be alive and living in the community 2 years later (6,7). Changes in marital status and household composition, such as death of a spouse, and declining health are typical life cycle events related to the aging process that may encourage elderly persons to change residence (3). Elderly non-movers are more likely to live with their spouse in independent households, compared with movers who are more likely to be widowed and to move in with their children or other relatives (1).

Speare, Avery, and Lawton (13) found that both the initial level of functional ability and amount of change in functioning (disability) from 1984 to 1986 predicted changes in living arrangements and residential mobility for many elderly people. Because most persons kept the same living arrangements between surveys, living arrangements in 1984 were a strong predictor of living arrangements in 1986. Disability (difficulties in ADL's and IADL's) predicted a change to more dependent living arrangements; level of disability had a significant and positive effect on living with others. Changes in functional limitations were even more strongly related to changes in living arrangements

than the initial levels of these measures. Health status and level of disability in 1984 were major predictors of both entering an institution in the 2-year interval and death by 1986. Reasons for moving indicated that health and disability were important considerations for many elderly movers.

Elderly moving decisions are based on complex and interrelated health and social motives (5). A life course typology by Litwak and Longino (8) consists of three stages of elderly migration: (1) amenity-related mobility in early retirement, (2) mobility motivated by moderate forms of disability, making it difficult to perform activities of daily living (ADL's), and (3) institutional moves in late old age due to chronic disability. Younger, recently retired migrants may move because their health is good—poorer health would deter them from moving; alternatively, the poorer health of the older elderly may prompt them to move to long-term care institutions (11). The elderly who move because of dependency or assistance needs have higher use of chronic health care facilities, rely more on family and friend support networks, and have lower overall levels of well-being.

These previous studies show that changes in health and functional status of the elderly over time include both improvement and deterioration. Elderly people adjust their living arrangements or relocate in response to changes in health and family support networks. Changes in health and disability measures should help predict risks of institutionalization and mortality. Differences by metro-nonmetro residence will impact on planning interventions in functional loss and appropriate health care services in local areas.

## Purpose and Objectives

The purpose of this research is to examine changes in functional status of the elderly over time, to assess the relationship between health and adjustments in living arrangements, and to determine the impact of residence on these changes. The expected path of transitions is from living independently to dependency and then to institutional care. The basic tenet of this research was that changes in health and/or social support would result in changes in living arrangements or residential mobility, especially toward places with better access to health and social services. One would expect elderly persons initially free of disability to have better health outcomes over time and lower risks of entering nursing homes or dying. One would also expect both those in declining health and the recently widowed to experience adverse changes in living arrangements and greater risks of institutional care or death.

This article focuses on transitions over the 1984 to 1990 interval. The following questions were addressed: (1) What changes can be expected in the health of a cohort of people 70 years and older over an interval of 6 years and how are transitions in health affected by initial health status? Do these patterns differ by metro-nonmetro residential location? and (2) What transitions can be expected in the living arrangements of a cohort of people 70 years and older over an interval of 6 years and what effect do changes in health status and marital status (widowhood) have on these living arrangements? Do these patterns differ by metro-nonmetro residential location?

## Data and Methods

The LSOA is designed to measure changes in functional ability and in living arrangements (including movement into and out of nursing homes) of a cohort of older people. The LSOA describes the continuum from functionally independent living in the community through dependence, possible institutionalization, and finally to death. The 1990 data file provides baseline and 6 years of follow-up information<sup>1</sup> on 7,527 noninstitutionalized persons 70 years or older when they participated in the 1984 Supplement on Aging to the National Health Interview Survey. By 1990, 55 percent of the initial sample completed the interview, 15 percent were not interviewed for various reasons, and 30 percent had died.

<sup>1</sup>Those interviewed in 1984 were reinterviewed in 1986, 1988, and 1990.

Data include demographic and health characteristics, including disability measured by activities of daily living (ADL's) and instrumental activities of daily living (IADL's); changes in those characteristics and reasons for change; and doctor, hospital, and nursing home use. The LSOA also contains information about elderly persons who (1) remained outside of institutions (with unchanged living arrangements, or living alone, or having moved to another residence, or living with someone else in their residence); (2) became institutionalized; and (3) died. Data on physical limitations provide information on persons who remained the same or changed in disability, difficulties with physical movement (such as walking, climbing stairs, and lifting), and the provision of help with ADL's or IADL's.

## Definitions

Two measures are used to assess the degree of disability. Activities of daily living, or ADL's, are the basic tasks of everyday life, including bathing or showering, dressing, eating, transferring (getting in or out of a chair or bed), walking, getting outside, and using/getting to a toilet. When people are unable to perform these activities, they need help in order to cope, either from other persons or via mechanical aids or devices. With advancing age, a higher proportion of persons have difficulty performing personal care or home management activities. ADL's, especially measures of mobility, such as walking and getting outside, are key indicators of one's ability to live independently in the community and are also significant predictors of admission to nursing homes, use of paid home care, and use of both hospital and physician services.

ADL's do not measure the full range of activities necessary for independent living in the community, and instrumental activities of daily living (IADL's) were developed to partially fill this gap. IADL's include meal preparation, shopping for personal items, managing money, using the telephone, doing heavy housework, and doing light housework. IADL disabilities capture those activities that are more complex and less severe than ADL difficulties.

Use of medical care is obtained from nursing home stays since 1984, hospital stays in the year before the interview, and contacts with doctors in the year before the reinterview.

This study defines disability in terms of a scale of impairment: (1) the healthiest, who are free of disability, (2) those with one or more IADL disabilities only, and (3) the most impaired—those unable to perform one or more ADL's, which makes independent living difficult. Transitions were examined over a 6-year interval, 1984 to 1990, so that the widest range of change could be observed. Intervals of 2 and 4 years may reveal real transitions as well as more temporary fluctuations.

Because the estimates in this article are based on a sample rather than the entire population of those 70 years and older, the estimates are subject to sampling error. Unless otherwise noted, all statements of comparison in the text are statistically significant at the 95-percent level of confidence.

## Results

### Changes in Health Status

Among all persons 70 years and older living in the community in 1984, 35 percent were not disabled by 1990, 13 percent had one or more IADL's only, 6 percent had one or more ADL's, 25 percent had both ADL and IADL difficulties, 6 percent were in nursing

homes, and 15 percent had died by 1990 (table 1). Among those who were not disabled in 1984 (68 percent of all persons 70 years and older living in the community), 48 percent remained free of disability, 38 percent declined in health, 4 percent entered nursing homes, and the remainder had died by 1990. Lower proportions of initially nondisabled persons ended up in nursing homes or had died by 1990 than the elderly who had some level of disability in 1984. Not surprisingly, the health of those with ADL difficulties in 1984 (the most disabled at baseline) deteriorated more than their less disabled counterparts, and higher proportions ended up in nursing homes or died. Some improvement in health can also be seen

**Table 1. Health status transitions of the elderly 70 years and older**

Health status		1990 Health status					
Measure of health	In 1984	Not disabled	1 + IADL's <sup>1</sup>	1 + ADL's <sup>2</sup>	Both ADL's + IADL's	Nursing home	Deceased
<i>Percentage</i>							
<b>Self-reported health</b>							
Excellent-very good	40.4	48.2	12.6	5.7	18.8	3.7	11.0
Good	31.4	36.8	13.4	6.5	24.9	6.1	12.4
Fair or poor	28.2	15.7	12.1	6.0	34.9	8.5	22.6
Total	100.0	35.4	12.7	6.0	25.2	5.8	14.7
<b>Functional status</b>							
Not disabled	67.8	47.6	13.6	5.9	18.4	3.8	10.8
1 + IADL's	10.0	13.5	20.0	4.5	35.2	8.3	18.5
1 + ADL's	21.7	7.5	6.9	7.3	42.4	10.9	24.9
Total	100.0	35.4	12.7	6.0	25.3	5.9	14.7

<sup>1</sup>1 + IADL's: those with one or more IADL difficulties only. Instrumental activities of daily living (IADL's) include meal preparation, shopping for personal items, managing money, using the telephone, doing heavy housework, and doing light housework.

<sup>2</sup>1 + ADL's: those with one or more ADL difficulties, may also have IADL's. Activities of daily living (ADL's) include bathing or showering, dressing, eating, transferring (getting in or out of a bed or chair), walking, getting outside, and using/getting to a toilet.

**Lower proportions of initially nondisabled persons ended up in nursing homes or had died by 1990 than the elderly who had some level of disability in 1984.**

over the 6-year interval—about 15 percent of elderly persons with ADL or IADL limitations in 1984 improved in health by 1990.

Elderly persons whose self-assessed health was very good to excellent at baseline were more likely to be free of disability by 1990 than were those initially in poorer health. A higher proportion of those initially in fair or poor health had both ADL and IADL limitations by 1990; they were also more likely to have entered nursing homes or died by 1990. The best health outcomes over the 6-year interval occurred to the elderly who rated their health as excellent or very good at the baseline, compared with those who rated their health as fair or poor.

**Metro-Nonmetro Residence (see box table)**

As measured by self-assessed health and functional limitations, the elderly in suburban areas are healthier than their counterparts in nonmetro areas and central cities (12). Nonmetro elders have more functional limitations and are also more likely to have certain chronic conditions, such as arthritis, that have a strong effect on their ability to perform various activities of daily living. Rogers (12) found that health status differences by residence persist even when other factors—age, race, social support networks, income, and education—are held constant. Moreover, residential location affects health status indirectly in that nonmetro elders are more likely to have those characteristics associated with poorer health. Nonmetro elders are likely to be less educated and financially worse off than their metro counterparts, and lower socioeconomic status is strongly associated with poor health.

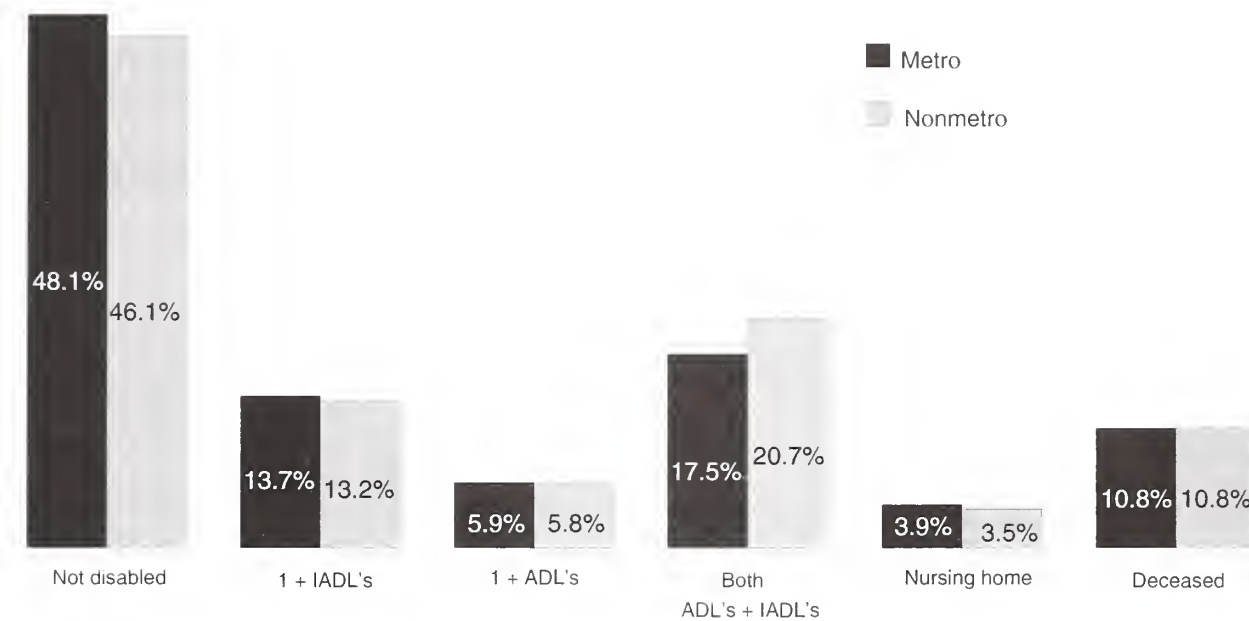
**Age and gender distribution of the elderly, by metro-nonmetro residence**

Characteristic	Metro	Nonmetro
<i>Percentage</i>		
<b>Age</b>		
70 - 74	42.2	39.5
75 - 79	29.8	32.9
80 - 84	16.9	17.0
85+	11.1	10.6
<b>Gender</b>		
Male	37.6	41.5
Female	62.4	58.5

The overall pattern of health transitions was similar by residential location (fig. 1). No metro-nonmetro differences were found in rates of institutional care or death over the 6-year interval. The major difference in health at the baseline (1984) was that nonmetro elders were more likely to have functional disabilities than metro elders; 26 percent of nonmetro elders had ADL difficulties in 1984, compared with 20 percent of metro elders.

Among the nondisabled elderly at baseline, a higher proportion of nonmetro elders experienced both ADL and IADL difficulties by 1990; health status declined for 40 percent of nonmetro elders, compared with 37 percent of metro elders. Among the elderly who had one or more ADL difficulties at baseline (the most disabled), a lower proportion of nonmetro elders improved in health, and a slightly higher proportion entered nursing homes or died, compared with metro elders. The poorer initial health and greater decline in

**Figure 1. Health status transitions of initially nondisabled elderly, by residence, 1990**



health of the nonmetro elderly may reflect in part the “aging in place” of many nonmetro communities, where the older and more disabled elderly persons remain in the community.

### Transitions in Living Arrangements

Changes in the living arrangements of the elderly, including entering a nursing home, reflect adjustments to changes in their social support networks. In 1984, 48 percent of the elderly age 70 and older were living with their spouse; by 1990, only 31 percent were still living with their spouse. By 1990, 6 percent of the elderly had entered nursing homes, and 15 percent had died. Among those initially living with their spouse, 63 percent remained so by 1990. A higher proportion of those living with others in 1984, compared with their counterparts who initially lived with their spouse, ended up in nursing homes or died by 1990.

**Metro-Nonmetro Residence.** The main difference in living arrangements of the elderly by metro-nonmetro residence is that in both 1984 and 1990 nonmetro elders were more likely to be living with their spouse and less likely to be living with others (table 2, p. 24). Similar proportions of metro and nonmetro elderly lived alone. Among those living with their spouse in 1984, nonmetro elders were more likely to remain living with their spouse over the 6-year interval. For those initially living alone, metro elders were more likely than nonmetro elders to remain living alone, but nonmetro elders were more likely to have died by 1990 (18 percent) than their metro counterparts (13 percent). Social support is associated with better outcomes over time, with fewer of those initially with their spouse entering nursing homes or dying 6 years later.

### Effect of Health on Transitions in Living Arrangements

**Initial Health Status.** The initial health status of elderly persons is expected to affect subsequent living arrangements. Elderly persons without disabilities in 1984, regardless of initial living arrangement, were more likely to be living with their spouse or alone in 1990 and less likely to have entered nursing homes or to have died than those who had either ADL or IADL limitations at baseline (table 3, p. 25).

The elderly who lived with their spouse **and were not disabled** in 1984 were more likely than other elderly to remain with their spouse (67 percent) and less likely to have entered a nursing home (4 percent) or to have died (13 percent) by 1990. Seven or 8 percent of those not initially living with their spouse had

**Table 2. Transitions in living arrangements of the elderly 70 years and older, by metro-nonmetro residence**

Living arrangement		1990 Living arrangement				
Metro-nonmetro residence	In 1984	With spouse	Alone	With others	Nursing home	Deceased
<i>Percentage</i>						
<b>Metro</b>						
With spouse	46.9	61.5	15.1	6.1	3.6	13.6
Live alone	36.4	1.1	67.7	11.3	6.9	13.0
With others	16.7	1.8	16.1	55.0	8.9	18.2
Total	100.0	29.6	34.4	16.2	5.7	14.2
<b>Nonmetro</b>						
With spouse	52.0	64.5	13.7	4.5	4.2	13.0
Live alone	36.3	1.8	61.8	10.3	8.5	17.6
With others	11.7	3.6	20.4	49.3	6.7	20.1
Total	100.0	34.6	32.0	11.8	6.0	15.5

entered nursing homes by 1990. Fourteen percent of those initially living alone and 19 percent of those living with others had died by 1990. The combination of being disabled and living with others at baseline increases the risk of institutional care and/or death 6 years later.

**Changes in Health.** Since initial health affects transitions in living arrangements, one would expect changes in health to operate in a similar way. Comparisons were made between the elderly whose health deteriorated and those whose health either improved or remained the same over the 6-year interval. By 1990, 46 percent of elders with unchanged health and 35 percent of those in better health were living with their spouse, whereas only 22 percent of those in

declining health lived with their spouse (table 4, p. 26). Higher proportions of elderly persons in unchanged or better health lived alone in 1990, compared with those in poorer health. The elderly whose health deteriorated over the interval were less likely to live with their spouse and more likely to shift to nursing homes or to die.

Among the elderly initially living with their spouse, 80 percent of those with unchanged health remained with their spouse over the 6-year interval, as did 70 percent of those in better health; only 49 percent of those in worse health remained with their spouse by 1990. Those whose health improved in the interval were more likely to be living alone in 1990 than either those with unchanged health or worse health.

Among the elderly with declining health, those who initially lived with their spouse had better outcomes by 1990 than their counterparts who either lived alone or with others at baseline. Of elderly persons in declining health, a lower proportion who initially lived with their spouse had entered nursing homes by 1990, compared with those who either lived alone or with others at baseline. The social support from living with one's spouse appears to have a beneficial effect on subsequent transitions in living arrangements. Furthermore, the most pronounced change in living arrangements of the elderly is the increased institutionalization and death for elderly persons in declining health.

**Table 3. Transitions in living arrangements of the elderly, by initial health status and living arrangements**

1984 Living arrangement		1990 Living arrangement				
Health status	Health status in 1984	With spouse	Alone	With others	Nursing home	Deceased
<i>Percentage</i>						
<b>Lived with spouse in 1984</b>						
Not disabled	74.7	66.6	15.0	5.4	2.4	10.5
1 + IADL's <sup>1</sup>	7.5	56.5	12.1	4.9	7.0	19.5
1 + ADL's <sup>2</sup>	17.9	48.3	14.8	6.8	7.4	22.8
Total	100.0	62.6	14.8	5.6	3.7	13.3
<b>Lived alone in 1984</b>						
Not disabled	65.7	1.6	71.7	10.5	5.7	10.4
1 + IADL's	11.1	1.5	61.9	12.0	7.0	17.6
1 + ADL's	23.2	0.5	52.0	12.1	12.4	23.1
Total	100.0	1.3	66.0	11.1	7.4	14.2
<b>Lived with others in 1984</b>						
Not disabled	52.5	3.1	20.2	60.2	4.0	12.5
1 + IADL's	15.6	0.8	17.0	52.3	12.0	17.9
1 + ADL's	31.9	1.4	11.6	43.8	13.9	29.3
Total	100.0	2.2	17.0	53.7	8.4	18.7

<sup>1</sup> 1 + IADL's: those with one or more IADL difficulties only. Instrumental activities of daily living (IADL's) include meal preparation, shopping for personal items, managing money, using the telephone, doing heavy housework, and doing light housework.

<sup>2</sup> 1 + ADL's: those with one or more ADL difficulties, may also have IADL's. Activities of daily living (ADL's) include bathing or showering, dressing, eating, transferring (getting in or out of a bed or chair), walking, getting outside, and using/getting to a toilet.

**Metro-Nonmetro Residence.** The effect of changes in the health of elderly persons on transitions in living arrangements is similar by metro-nonmetro residence. For elders whose health either improved or remained unchanged over the interval, the main residential difference is that by 1990, nonmetro elders were more likely to live with their spouse and less likely to live alone or with others than metro elders (fig. 2, p. 27).

Even nonmetro elders in deteriorating health were more likely to live with their spouse (25 percent) than metro elders (20 percent). Otherwise, the effect of declining health is the same by residential location, with 10 percent entering nursing homes and 25 percent dying.

### **Marital Change**

Changes in marital status, especially widowhood, are good indicators of the shifting social support networks of elderly people. As previously seen, strong social support tends to have a beneficial effect on health. Also, married elderly persons living with their spouses are more likely to rate their health as very good to excellent

**Table 4. Transitions in living arrangements of the elderly, by change in health status**

Health status change	1984 Living arrangement	1990 Living arrangement				
		With spouse	Alone	With others	Nursing home	Deceased
<i>Percentage</i>						
<b>Better health</b>						
With spouse	49.5	69.6	26.8	3.6	—	—
Live alone	36.6	—	85.7	14.3	—	—
With others	13.9	4.3	22.7	73.0	—	—
Total	100.0	35.1	47.8	17.1	—	—
<b>No change in health</b>						
With spouse	56.1	79.5	15.8	4.7	—	—
Live alone	32.3	3.0	87.7	9.3	—	—
With others	11.6	5.7	26.2	68.2	—	—
Total	100.0	46.2	40.2	13.6	—	—
<b>Worse health</b>						
With spouse	44.1	48.6	12.7	6.7	6.9	25.1
Live alone	38.2	0.7	52.7	11.5	12.1	23.1
With others	17.7	0.8	12.4	46.8	12.5	27.6
Total	100.0	21.8	27.9	15.6	9.9	24.8

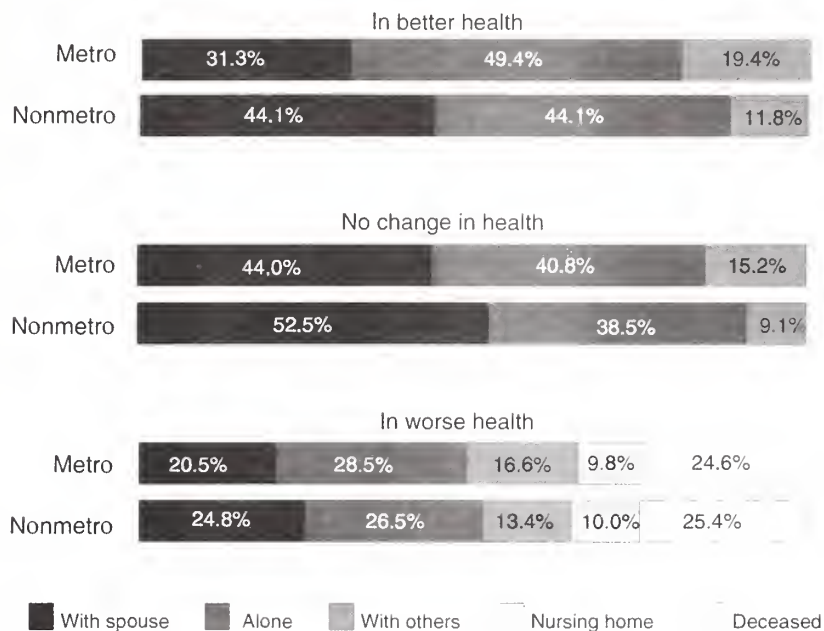
— Indicates no elderly were in this living arrangement.

and less likely to have difficulty performing the various activities of daily living than widowed, divorced, or separated persons. A higher proportion of elders with no change in marital status remained free of disability by 1990 (42 percent), compared with those who became widowed (38 percent) in the interval. Among the nondisabled elderly at baseline, fewer widows remained free of disability by 1990

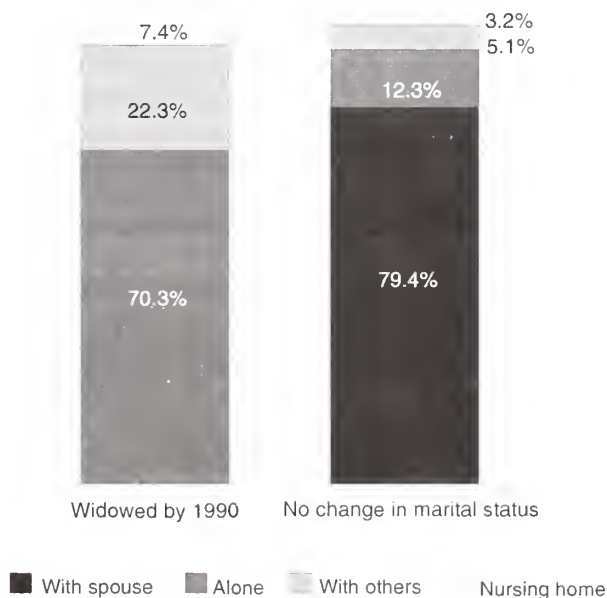
(48 percent) than those without a change in marital status (54 percent). At advanced ages, nearly all changes in marital status result from the death of one's spouse, which clearly affects the living arrangements of elderly persons. Widowhood involves a shift from living with one's spouse to living alone or with others (fig. 3). It also signals a shift to living in nursing homes.

**Metro-Nonmetro Residence.** Among the elderly without a change in marital status, nonmetro elders initially living with their spouse are slightly more likely than metro elders to remain living with their spouse (82 vs. 78 percent) and less likely to live with others (4 vs. 6 percent) (fig. 4, p. 28). Nonmetro widows are somewhat more likely to enter nursing homes than their metro counterparts (10 vs. 6 percent). In general, transitions in living arrangements by changes in marital status are similar by metro-nonmetro residence.

**Figure 2. Transitions in living arrangements of the elderly, by residence and change in health status, 1990**



**Figure 3. Transitions in living arrangements of the elderly initially living with their spouse, by change in marital status, 1990**



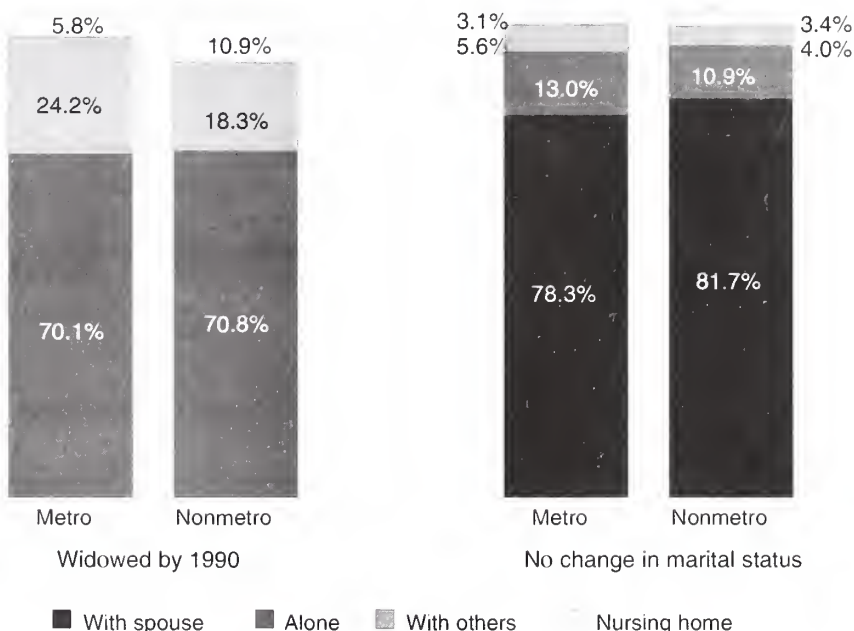
### Change in Residence

Residential mobility among the elderly is lower than among the general population. Whereas 44 percent of all persons age 5 and older moved between 1984 and 1990, only 9 percent of elderly persons age 70 and older moved during this period. This percentage was only slightly higher in metro areas than in nonmetro areas. The most frequently given reasons for moving are associated with poor health, social support networks (remarriage, moving to be closer to family), financial considerations, and other/multiple reasons. Among the nonmetro elderly, 28 percent moved because of poor health, 18 percent moved to be closer to social support networks, 15 percent moved for financial reasons, and 18 percent for other or multiple reasons. A similar pattern is found among metro elderly persons.

Since poor health is frequently given as a reason for moving, changes in health are expected to influence residential mobility. Among the metro elderly who were initially nondisabled, a lower proportion of movers had moved between counties (20 percent) than had moved locally. In contrast, among nonmetro elders who were initially free of disability, 31 percent of movers had moved between counties. Perhaps the metro elderly in better health moved to nonmetro areas after retirement for amenity-related reasons, whereas the mobility of more disabled nonmetro elders was motivated by the location of health care services in metro areas. Although type of residence at destination was not determined, some nonmetro elders, particularly those at greater distances from metro areas, may have moved to be closer to relatives and/or health care and social services in metro areas.

The elderly whose health deteriorated over the interval were less likely to live with their spouse and more likely to shift to nursing homes or to die.

**Figure 4. Transitions in living arrangements of the elderly initially living with their spouse, by residence and change in marital status, 1990**



## Summary and Conclusion

This study, based on 6-year rates of functional change, supports the findings of previous research showing that some elderly exhibit long-term functional improvement but more commonly, there is a decline in their functional ability. Both the initial level of functional ability and amount of change in functioning influenced changes in living arrangements and residential mobility. Furthermore, this research documents the link between functional decline and increased risk of institutionalization, death, and other changes in living arrangements and residence.

The majority of elderly people living in the community are in good health, and about half of the elderly who were not disabled in 1984 remained so 6 years later. The level of initial disability affected health outcomes over time, with fewer of the initially nondisabled entering nursing homes or dying by 1990. In general, the nonmetro elderly had poorer initial health than their metro counterparts and experienced a somewhat greater decline in health status than their metro counterparts over a 6-year interval. Rates of institutional care and dying were similar by metro-nonmetro residence.

Elderly people make adjustments in their living arrangements in response to changes in their health and social support networks. Elderly persons initially living with their spouse were less likely to enter nursing homes or die within 6 years, compared with those who initially lived either alone or with others. Nonmetro elderly persons were more likely to be living with their spouse than the metro elderly, and such social support may ameliorate their poorer health to some extent. Having someone in the household, primarily one's spouse, who could offer assistance is beneficial to the health of the elderly and acts as a buffer to institutionalization. Regardless of metro-nonmetro residence, deteriorating health results in an increased likelihood of entering a nursing home or dying in the interval. The elderly who were initially disabled and also living with others had the greatest risk of institutionalization and death. Advanced age and widowhood were also strong predictors of a person's entering a nursing home or dying.

About 9 percent of the elderly moved between 1984 and 1990. Decisions to move are based on complex interrelated health and social motives. The most common reasons for moving are associated with poorer health, moving closer to family, financial considerations, and other/multiple reasons. Some nonmetro elders may move to be closer to relatives and to obtain health care services in metro areas. This may be especially true of the more disabled nonmetro elderly who relocate for both health-care resource and social support considerations.

A substantial and growing number of the elderly have, or are at risk of developing, chronic conditions that impair their ability to function independently.

The ability or inability of the elderly to obtain help with difficult personal care activities is an important factor in determining which individuals are able to remain in the community and which must enter nursing homes or other institutions for needed care and assistance. The incidence and duration of disability has

important consequences for long-term care and federal spending as well as for effective local planning for health care and other services. Furthermore, residential moves that are strongly associated with health factors can have potentially large impacts on local public resources, particularly health and social services.

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# Trends in Food and Alcohol Consumption Away From Home

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In the early 1970's, American households spent about one-fifth of their food dollar on food away from home. From the mid-1980's to the present, households have been spending about twice that proportion on food away from home. According to the 1992 Consumer Expenditure Survey, U.S. households allocated 38 percent of their food dollar to food away from home and 46 percent of their alcohol dollar to alcohol consumed outside the home. Consumers who spent the greatest share of their food dollar on food away from home were in the highest income quintile, under age 25, or living alone. Sales at eating and drinking places were up 134 percent between 1980 and 1993, with a corresponding 48-percent increase in the number of employees at these establishments. Factors that influence the decision to dine out include the increasing numbers of women in the labor force, the trend toward more one-person households, price competition among restaurants, and the interest in restaurants that offer some type of entertainment. Consumption trends when dining out, demographic influences, and other issues of concern to nutritionists, food policymakers, and restaurateurs are presented.

**W**e make food choices many times each day—what to eat, how much to eat, when to eat, and where to eat.

Food and drinks can be purchased at food retail stores and consumed either at home (in someone's home) or purchased away from home in restaurants and other establishments. A number of factors influence our choice of where to eat, including time, convenience, cost, and nutrition. Many people, after a full day at work, lack the energy or interest needed to cook. Very often, people dine in restaurants because they make a last-minute decision and just feel like going out or they want to socialize with friends and family. This article

examines various trends related to food and drinks purchased away from home, including food prices; aggregate, household, and government expenditures; and restaurant trends—food retailing and findings from surveys of restaurant customers.

## Prices

In 1994, prices for food, as measured by the Consumer Price Index (CPI), rose 2.4 percent over 1993 (table 1). This annual increase was slightly less than the 2.6-percent increase for all items during the same period. The price of food at eating places—food away from home—was up 1.7 percent,

**Table 1. Annual percent change in prices of food and alcohol, 1993-94 and average annual change, 1984-93. Consumer Price Index for all urban consumers [1982-84=100]**

Group	Annual percent change 1993-94	Average annual percent change 1984-93
All items	2.6	3.8
Food	2.4	3.5
At home	2.9	3.5
Away	1.7	3.7
Lunch	1.7	3.7
Dinner	1.8	3.5
Other/snacks	1.6	3.8
Alcohol	1.3	4.1
At home	.2	3.6
Away	2.5	5.3

Source: U.S. Department of Labor, Bureau of Labor Statistics, *CPI Detailed Report*, January issues.

**Americans spent \$197.8 billion on eating away from home in 1993, an increase of 9 percent over 1992.**

whereas the price of food purchased at supermarkets and other grocery stores—food at home—was up 2.9 percent. Between 1984 and 1993, the average annual percent change in prices for all goods and services was 3.8 percent, compared with 3.5 percent for food at home and 3.7 percent for food away from home.

Compared with the other major components of the CPI, prices for food increased less in 1994 than housing (2.5 percent), transportation (3.0 percent), medical care (4.8 percent), entertainment (2.9 percent), or personal and educational expenses (5.9 percent) (14). Since 1989, the increase in the overall CPI has been greater than the increase for food away from home (fig. 1, p. 32).

In 1994, prices for alcohol, as measured by the CPI, rose 1.3 percent, less than the average annual increase of 4.1

percent between 1984 and 1993 (table 1). The price of alcohol away from home increased 2.5 percent in 1994, compared with an increase of only 0.2 percent for alcohol at home (15).

## Expenditures

### Aggregate Expenditures

Americans spent \$197.8 billion on eating away from home in 1993, an increase of 9 percent over 1992 (table 2, p. 32). The expenditure for food at home in 1993 was \$329.5 billion, only 2 percent more than was spent in 1992. As a portion of disposable personal income, food away from home increased from 3.7 percent in 1970 to 4.2 percent in 1993; food at home, however, decreased from 10.3 percent of disposable personal income in 1970 to 7.0 percent in 1993. Although dollars spent on food increased greatly over the years, the gain in disposable income was greater.

After adjustment for inflation, food expenditures per capita increased 21 percent between 1970 and 1993, while per capita income increased 45 percent. As a result, the proportion allocated to total food (home and away) dropped 19 percent between 1970 and 1993. As income rises, the proportion allocated to food goes down, as there is more money to spend on other discretionary items (12).

Americans spent \$85.5 billion on alcohol in 1993, of which \$37.4 billion was on alcoholic drinks consumed away from home at eating and drinking places; the remainder was spent on packaged alcohol purchased at liquor stores, food stores, and convenience stores. Although there was an increase from 1992 of \$732 million, or 2 percent, in spending on alcohol away from home, this was offset by a 2-percent decrease of about \$1.1 billion spent on alcohol at home (12).

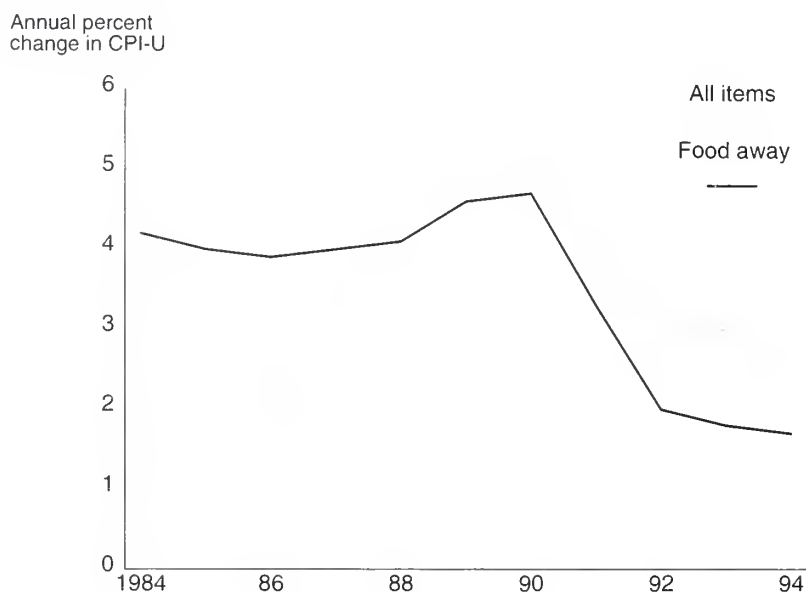
### Household Expenditures

The 1992 Consumer Expenditure Survey (CE), conducted by the Bureau of Labor Statistics, was used to obtain data on households' food and beverage purchases away from home.<sup>1</sup> Expenditures on meals and snacks eaten away from home in 1992 averaged \$1,631 per household (table 3). Whites and others<sup>2</sup> spent \$1,717, whereas Blacks spent

<sup>1</sup>The Consumer Expenditure Survey defines food away from home as all meals or snacks purchased in restaurants, cafeterias, cafes, drive-ins, carry-outs, and vending machines, including trips, plus meals as pay, school lunches, special catered affairs, and meals away from home on trips. Food at home is the total expenditures for food and grocery stores or other food stores (excluding nonfood items) and food prepared by the consumer.

<sup>2</sup>Category includes people who are White, American Indian, Aleut, Eskimo, Asian, and Pacific Islander.

**Figure 1. Changes in consumer prices of all items and food away, 1984-94**



Source: U.S. Department of Labor, Bureau of Labor Statistics, CPI Detailed Report, January issues.

**Table 2. Food expenditures by families and individuals as a share of disposable personal income, selected years, 1970-93**

Year	Disposable personal income  Billion \$	Expenditures for food				
		At home		Away from home		Total
		Billion \$	Percent	Billion \$	Percent	Billion \$
1970	722.0	74.2	10.3	26.4	3.7	100.6
1975	1,150.9	115.2	10.0	45.9	4.0	161.1
1980	1,952.9	179.1	9.2	85.2	4.4	264.4
1985	2,943.0	230.7	7.8	129.4	4.4	360.1
1990	4,050.5	306.7	7.6	172.4	4.3	479.1
1991	4,236.6	320.6	7.6	174.9	4.1	495.5
1992	4,505.8	322.1	7.1	181.7	4.0	503.7
1993	4,688.7	329.5	7.0	197.8	4.2	527.4

Source: Putnam, J.J. and Allshouse, J.E., 1994, *Food Consumption, Prices, and Expenditures, 1970-1993*, Statistical Bulletin No. 915, U.S. Department of Agriculture, Economic Research Service.

**Table 3. Average annual expenditures of CE households on food away from home, by demographic characteristics, 1992**

Demographic characteristic	Mean dollars
All	\$1,631
Income quintiles	
Lowest	612
2nd	1,030
3rd	1,464
4th	2,092
Highest	3,168
Age (years)	
Under 25	1,181
25 - 34	1,732
35 - 44	2,017
45 - 54	2,131
55 - 64	1,521
65 and over	987
Composition of household	
Husband and wife only	1,921
Husband and wife with children	2,170
Single parent (at least one child under age 18)	1,131
One person	1,004
Race	
White and other	1,717
Black	953
Region	
Northeast	1,686
Midwest	1,610
South	1,550
West	1,730
Urbanicity	
Urban	1,675
Rural	1,349

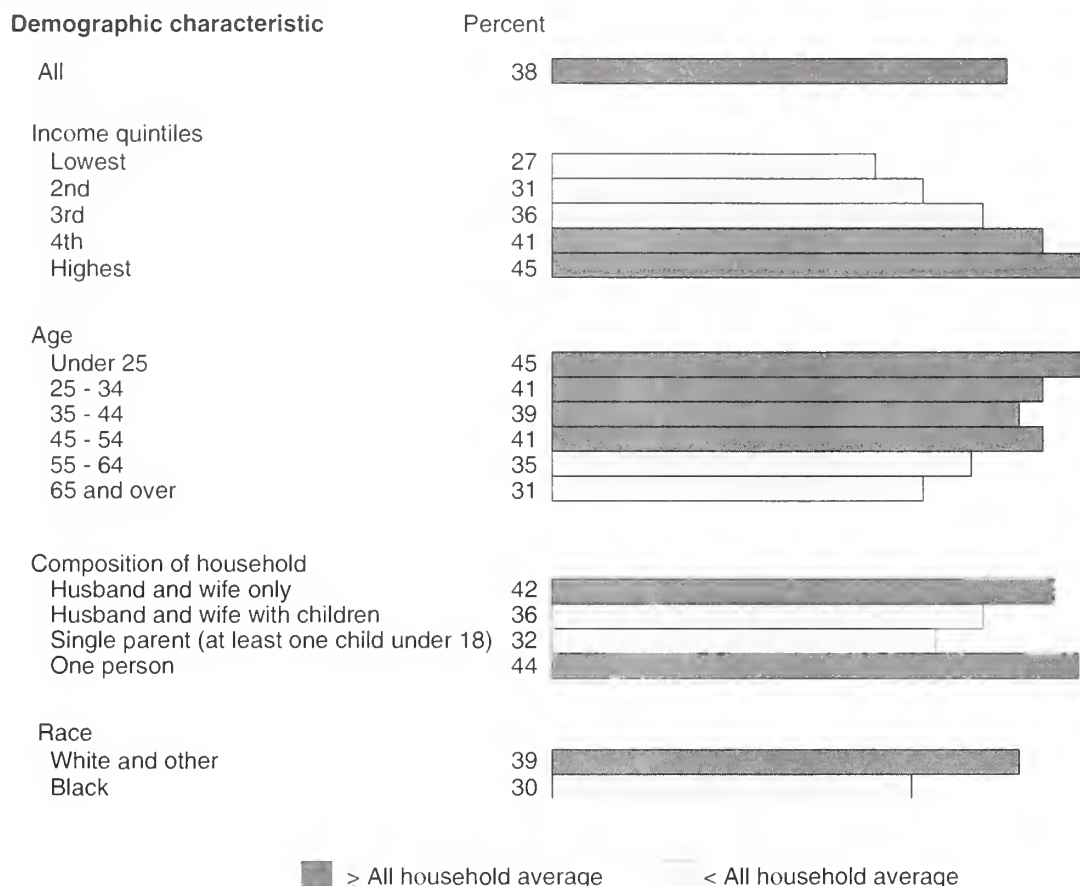
Source: U.S. Department of Labor, Bureau of Labor Statistics, 1992, Consumer Expenditure Survey, unpublished data.

\$953. Households in the West spent the most (\$1,730), whereas households in the South spent the least (\$1,550). Spending on food away from home increased as income increased. Those who had higher than average expenditures included married-couple households (both with and without children), homeowners, and those in urban areas, whereas those who had lower than average expenditures included households headed by someone either under age 25 or age 65 or older, single-parent households, single persons, and those in rural areas (14).

Overall, households spent 38 percent of their food dollar on food eaten away from home in 1992 (fig. 2, p. 34). A similar proportion was spent in 1991, down from the 42-percent share spent in both 1990 and 1989. By comparison, about 20 percent of the food dollar in the early 1970's was spent on food away from home.

Households that allocated a greater than average portion of their food dollar to food away from home included those in the highest two income quintiles, those headed by a person age 54 and younger, husband-wife only households, and Whites and others. One-person households also allocate a very large portion of their food dollar (44 percent) to eating out (14). The number of one-person households increased from 21.4 million in 1970 to 41.8 million in 1992 (13). Households that allocated a smaller than average portion to food away from home included those in the lowest three income quintiles, those headed by a person age 55 and older, those families with children at home (both husband-wife and single-parent), and Blacks (14).

**Figure 2. Portion of the food dollar allocated to food away from home, 1992**



Source: U.S. Department of Labor, Bureau of Labor Statistics, 1992, Consumer Expenditure Survey, unpublished data.

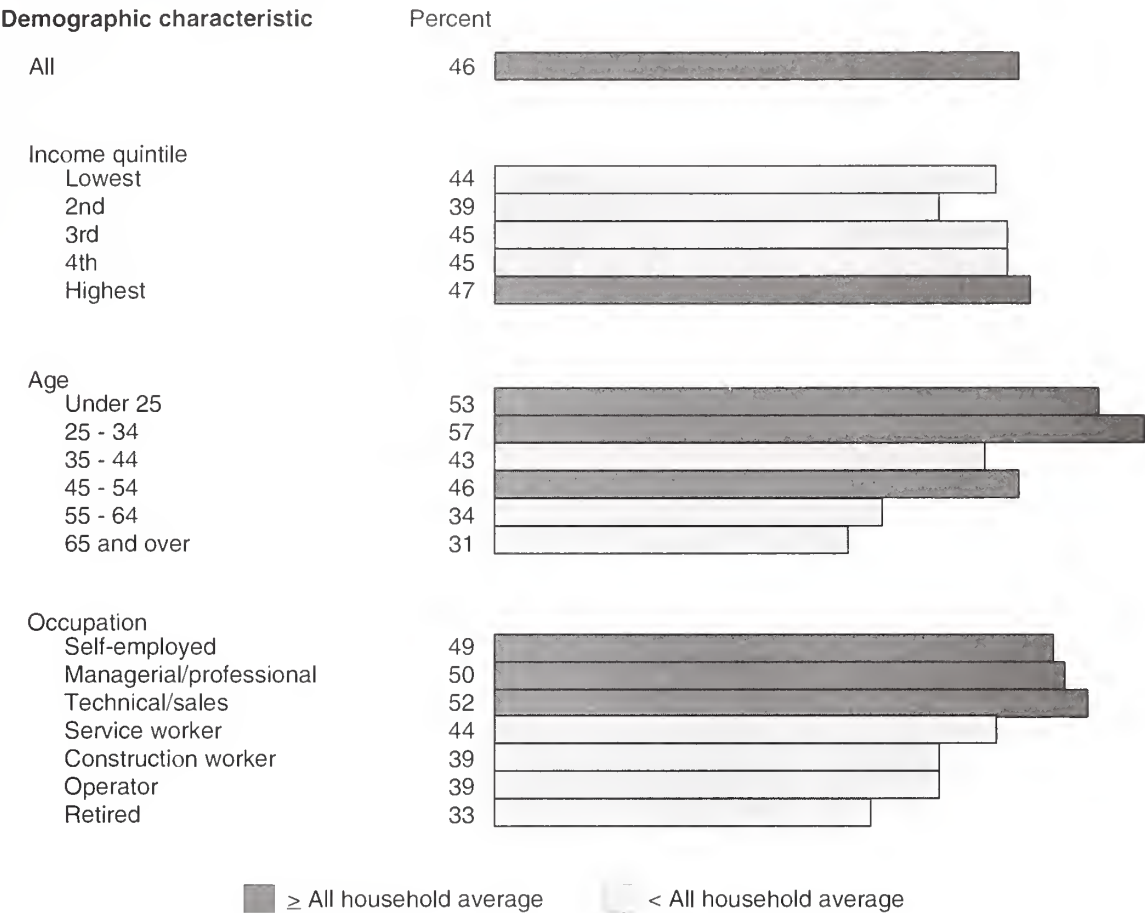
In 1992, 46 percent of alcohol expenditures were for alcohol consumed away from home (fig. 3). This proportion was highest in the highest income quintile, in the two youngest age categories (under 25 years old and 25 to 34 years), and among those employed in technical/sales or managerial/professional occupations or self-employed (14).

According to the 1992 Consumer Expenditure Survey, dinner accounted for nearly half of dining-out expenditures, lunch for about one-third, with the remainder consisting of snack, breakfast, and brunch expenditures (fig. 4, p. 36). Blacks spent equally on lunch and dinner out, whereas Whites and others spent 35 percent more on

dinner out than on lunch out. By occupational groups, managers and professionals spent the most on breakfasts and lunches out, whereas construction workers spent the most on snacks. Retired people spent the least on dining out (14).

The cost of food eaten on out-of-town trips in 1992 averaged \$167 for all households. Households residing in the

Figure 3. Portion of the alcohol dollar allocated to alcohol away from home, 1992



Source: U.S. Department of Labor, Bureau of Labor Statistics, 1992, Consumer Expenditure Survey, unpublished data.

West spent the most (\$201), whereas households in the South spent the least (\$139). Another type of expenditure for food away from home is school lunches, which averaged \$46 for all households. Husband/wife families with an oldest child between 6 and 17 years had the highest average school-lunch expenditure (\$184) (14).

Governmental Expenditures

In addition to household expenditures for school lunches, households make further expenditures on food away from home indirectly through their tax dollars. The Federal Government, in cooperation with State and local governments, operates five food assistance programs to provide meals and snacks to preschool and school-age children.<sup>3</sup>

Expenditures for these programs—the National School Lunch, School Breakfast, Special Milk, Child and Adult Care, and Summer Food Service Programs, totaled \$7.1 billion in fiscal 1993, a 6.6-percent increase over fiscal 1992 (3).

<sup>3</sup>Food assistance programs, such as the Food Stamp Program and WIC—the Special Supplemental Nutrition Program for Women, Infants, and Children, lower food-at-home expenditures if their value is not included.

The largest of these programs, the National School Lunch Program, served an average of 24.9 million children per day in fiscal 1993 at a cost of \$4.1 billion, up from \$3.9 billion spent and 24.7 million children per day served in fiscal 1992. The School Breakfast Program served an average of 4.9 million children per day in fiscal 1992 and 5.3 million children per day in fiscal 1993. Expenditures rose from \$787 million in fiscal 1992 to \$868 million in fiscal 1993. Many of these meals are available free or at reduced prices to economically qualified households (3).

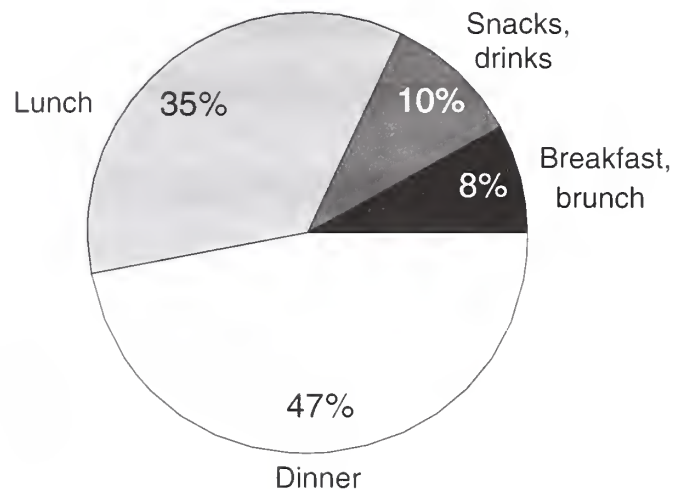
The Child and Adult Care Food Program serves meals to children in nonresidential child-care centers and family day-care homes and to chronically impaired adults and persons over age 60 enrolled in adult day-care centers. The program served 1.3 billion meals in fiscal 1993 with an average daily participation of 2.06 million people. This was up from 1.2 billion meals served and an average daily participation of 1.93 million in fiscal 1992 (3).

## Restaurant Trends

### Food Retailing — Sales and Employment

Between 1980 and 1990, retail sales at eating places rose 120 percent and continued to climb through 1993. Retail sales at drinking places increased 22 percent between 1980 and 1990, peaked in 1992, then fell 2 percent in 1993 (13). Declining alcohol consumption, with price stability, was responsible for declining alcohol sales. Consumption of alcohol by the adult population age 21 years and over, which peaked in 1981 at 43.1 gallons per person, declined 8 percent between 1990 and 1993—from

**Figure 4. Allocation of dining-out expenditures, 1992**



Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, 1992, Consumer Expenditure Survey, unpublished data.

40.0 to 36.8 gallons. The consumption of distilled spirits declined 14 percent, and wine and beer consumption declined 7 percent during this time (12).

Millions of Americans are dependent on the food retailing industry for their livelihood—about 3 in 10 employees in service occupations work in food preparation and service (13). In 1993, 6.9 million workers were employed at the over 400,000 eating and drinking places in the United States, up from 6.5 million workers in 1990 and 4.6 million in 1980 (table 4). The average hourly earnings of production workers in this industry in 1993 was \$5.35, up from \$3.69 in 1980. The number of employees at eating and

drinking places grew at an annual rate of 4.5 percent during the 1980's but is projected to slow to a growth rate of 1.9 percent between 1990 and 2005, based on assumptions of moderate growth. Specific job categories that are projected to grow faster than this rate are: Restaurant cooks (2.8 percent annual increase), food counter and fountain workers (2.3 percent), dining room and cafeteria attendants and bar helpers (2.3 percent), short-order and fast-food cooks (2.2 percent), food service managers (2.2 percent), and food preparation workers (2.1 percent). The growth rate for waiters is projected to slow to 1.7 percent (13).

**Table 4. Number of employees and average earnings at eating and drinking places, selected years, 1980-93**

Year	Total employees (in thousands)	Production workers <sup>1</sup> average earnings (dollars per hour)
1980	4,626	\$3.69
1990	6,509	4.97
1991	6,571	5.18
1992	6,485	5.29
1993	6,863	5.35

<sup>1</sup>Over 90 percent of employees at eating and drinking places are classified as production workers.

Source: U.S. Department of Commerce, Bureau of the Census, 1994, *Statistical Abstract of the United States*, 1994, [114th ed.]

## Findings from Surveys of Restaurant Customers

**Impulse Meals.** A recent Roper Starch Worldwide survey found that 71 percent of Americans would eat most dinners at home, even if money were no object. However, 56 percent had eaten dinner at a restaurant or fast-food place during the week preceding the survey. Only 16 percent of survey respondents had not eaten out during the previous month. Most restaurant meals appear to be bought on impulse, serving as a time-and/or labor-saving device for many. According to Waldrop (16), the most recent decision to eat out for 51 percent of Americans was made at the last minute. The most likely age group to decide to eat out on impulse was young adults under age 30 (64 percent). Seventy-five percent of trips to fast-food restaurants and 42 percent of dinners at full-service restaurants were last-minute decisions. The most frequent reason given by Roper respondents for eating dinner at a restaurant was that the respondent "just felt like going out." The next most frequent reason was "socializing with friends" (16).

**Generation X.** American consumers born between 1965 and 1976, often referred to as "Generation X," allocate nearly 25 percent of their discretionary income to eating out, and they go out to dinner more than any other age group, according to the National Restaurant Association's *Consumer Reports on Eating Share Trends*. At all types of restaurants, this age group prefers Mexican food, hamburgers, and sandwiches, with fast food accounting for 80 percent of their restaurant visits. These young adults tend to be less concerned about health and nutrition and are less likely than middle-age adults to consciously restrict their sugar and cholesterol intake. Generation X is interested in restaurants that offer all-you-can-eat specials, as well as restaurants with a lively, entertaining atmosphere, such as display cooking or live music (5).

**Men.** Men, particularly those age 55 or older, are likely to be frequent patrons of lower check (average check under \$10 per person) table-service restaurants. According to *Nutrition and Restaurants: A Consumer Perspective*, one-third of this sex/age group ate at this type of restaurant more than once a week. In contrast, only 13 percent of women reported doing so (11).

Fast-food restaurants were also more popular among men, particularly those under age 35. Twenty-five percent of men, and nearly 33 percent of men ages 18 to 24, frequented fast-food places more than once a week, compared with 13 percent of women. Those age 55 and older were the least likely group to patronize fast-food restaurants. Men ages 35 to 54 were the group most likely to frequent self-service cafeterias or buffets, with 14 percent patronizing these establishments more than once a week (11).

Carryout food from all types of restaurants was popular among men, with 20 percent reporting having purchased a carryout meal more than once a week. This figure rose to 30 percent for men ages 18 to 34. Also popular among these young men was purchasing a freshly prepared meal from a super-market, convenience store, or deli—17 percent reported purchasing this type of meal more than once a week, compared with 12 percent of all men and 6 percent of all women. Delivery of meals from fast-food or table-service restaurants was used by only 2 percent of consumers more than once a week but by 39 percent at least once a month. Home delivery was reported most often by families with children and men ages 18 to 34 (11).

**When dining out for a special occasion, 55 percent of adults were not concerned with nutrition. . .**

**Menu Choices.** According to the National Restaurant Association's 1993 survey, *Nutrition and Restaurants: A Consumer Perspective*, most Americans would like to see restaurants offer a wider array of healthy menu selections, including food offerings for people on restrictive diets. However, restaurant patrons' behavior does not always mirror their concerns. Only 55 percent of adults reported that they pay attention to the nutritional content of the food they eat. In addition, half of adults said they eat whatever they want whenever they feel like it. When dining out for a special occasion, 55 percent of adults were not concerned with nutrition, a proportion that had not changed substantially since 1986 when the study was first undertaken (10).

Over three-fourths of respondents indicated that restaurants should offer different sized portions for different sized appetites, lessening the tendency to overeat. The National Restaurant Association's *1993 Menu Analysis* compared 66 representative restaurant menus from 1988 with 1993 menus from the same restaurants: menus offering entrees with more than one portion size, such as "queen-size" and "king-size" steak, increased 12 percent during this period (10).

Whereas, the 1986 survey reported consumers' concerns about sodium in menu items, the 1992 survey revealed consumers' concerns about dietary fat (10). However, customers are often unwilling to sacrifice the satisfying taste of fat when dining out, regardless of what they say to market researchers. For example, recent attempts by the fast-food industry to offer lowfat hamburgers, skinless chicken, and light Mexican fare were not received well by consumers.

The targeted audience of health-conscious consumers who do not ordinarily frequent fast-food restaurants did not materialize. These marketing failures point out that consumers are very inconsistent when it comes to fat in foods—they tell researchers they are more interested in lowfat foods than they really are (1).

Another way in which restaurants are addressing customers' concerns about fat is by offering a wider selection of meatless entrees, particularly pasta. The number of meatless main dishes on menus was up 23 percent between 1988 and 1993. In addition, 71 percent of surveyed customers reported that restaurants are usually responsive to special requests, such as serving salad dressing on the side. Consumers may have had their fill of nutrition advice from the news media—nearly half of respondents said they were tired of hearing about which foods are good or bad for them (10).

**Ethnic Entrees.** The availability of ethnic-inspired entrees on restaurant menus rose from 37 percent of menu offerings in 1988 to 47 percent in 1993, according to the *1993 Menu Analysis*. Most popular among ethnic offerings were Mexican and Italian, although Chinese, Thai, and Japanese were each up about 10 percentage points during this period. Ethnic food may address two possible consumer concerns: nutrition and cost. Unlike meat-centered American dishes, many ethnic dishes use meat only as a minor ingredient, if at all. Meatless dishes tend to be among the lowest priced menu entrees (8).

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**Pasta.** Pasta orders in restaurants increased 38 percent between 1989 and 1993. During this time, the number of pasta entrees on menus rose nearly 60 percent. In addition, 90 percent of consumers surveyed in the *1993 Menu Analysis* believed that pasta is a good value for the money and a healthy choice. Pasta experienced its greatest growth in casual-dining restaurants, where orders increased 69 percent from 1989 to 1993. Pasta also gained in popularity in fine dining, or higher check (average check over \$10) restaurants, as well as in fast-food restaurants.

Establishments offering pasta dishes are responding to customer demand for vegetarian alternatives—over 40 percent offered meatless pasta dishes in 1993, up from about 25 percent in 1988. Restaurant patrons with household incomes of \$60,000 or more and those with professional or managerial occupations were the most likely groups to order pasta, whereas blue-collar customers were the least likely (6).

**Fast Food and Pizza.** Several fast-food hamburger chains have added “value meals,” also called “combo meals,” to their menus. According to the National Restaurant Association, these value meals, which usually consist of a large sandwich, French fries, and a soft drink, are especially popular at dinner with a bargain-hungry public. Customers may have shifted some of their allegiance from pizza places to quick-service hamburger places in 1992. According to Edmondson (2), the market for pizza is now mature, having reached a low but stable growth rate. Customer counts at pizza places were up only 1 percent in 1992, compared with a 5-percent gain in 1989 and 3-percent gains in both 1990 and 1991. Customer counts at quick-service hamburger places were

up 3 percent in 1992. In an effort to compete with value meals, the major pizza chains added bigger pizzas to their menus (9).

Quick-service pizza restaurants are heavily concentrated in the Northeast and the Midwest, whereas many areas of the South have none. After rapid growth over several decades, the number of stores (about 58,000) has not changed since 1992. The most frequent customers are young, affluent, college-educated adults (2).

**Coffee.** In 1970, Americans drank 33.4 gallons of coffee per person, but by 1988, consumption had fallen to 25.7 gallons (12). However, the popularity of specialty coffees and the emergence of coffee bars helped per capita consumption reach 27.8 gallons in 1992. Coffee bars may serve as alternatives to traditional alcohol bars for socializing. Operators of table-service restaurants reported in the National Restaurant Association's *1994 Tableservice Operator Survey* that customers were ordering more specialty and premium coffees in 1993, particularly in restaurants with higher average checks. Coffee consumption at fast-food places increased by 36 percent between 1980 and 1993. Fast-food places accounted for 42 percent of coffee consumed away from home in 1993. Coffee is increasing in popularity among young adults and even teenagers. There is a growing perception among younger consumers that coffee can be enjoyed throughout the day, not only at mealtime. Coffee ordered as a between-meal snack has risen steadily in recent years, whereas coffee ordered with lunch or dinner has declined. In 1993, 39 percent of coffee orders occurred with breakfast, 24 percent with lunch, 22 percent with dinner, and 15 percent as snacks (4).

**Premium Beer.** During the 1990's, restaurant sales for all types of beer have been increasing, according to the National Restaurant Association's *Tableservice Trends 1994*. Although consumption per person dropped 7 percent between 1990 and 1993, this was offset by a price increase of 16 percent.

In particular, consumption of premium beers—craft-brewed, made by a micro-brewery or regional brewer in small batches—rose. The number of craft breweries operating in the United States grew from 30 in 1985 to 382 in 1993. The number of barrels of craft-brewed beer increased 40 percent between 1992 and 1993, whereas there was little change in the number of barrels of total beer sold domestically. Consumers seem to be more willing to pay premium prices for beer than for other products—over 40 percent of surveyed adults believed that some blends of beer are different and worth paying more for.

According to the *Consumer Reports on Eating Share Trends*, between 1989 and 1993, the proportion of consumers with household incomes of \$60,000 or more who ordered beer in restaurants increased from 15 to 25 percent. At the same time, the proportion of consumers with household incomes of less than \$40,000 who ordered beer at restaurants declined from 58 to 45 percent. During the 1980's, 43 percent of beer orders in restaurants were from customers with professional or managerial occupations; 22 percent were from blue-collar workers; 20 percent were from agricultural workers, retirees, or unemployed people; and 15 percent were from those in clerical or sales jobs (7).

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## Summary

For many years, prices of food away from home have risen more slowly than prices for most other major commodities, adding to the appeal of dining out. Demographic characteristics that influence household expenditure for food away from home include: Income (spending increases as income increases), race (higher among non-Black households), age of household head (highest among those ages 25 to 64), household composition (higher in married-couple families both with and without children), and region (higher in the West and in urban areas). Alcohol consumption among adults has declined over the past decade.

Restaurant trends include: a deeper understanding of consumers' requests for wider menu selections and choices of portion sizes, greater availability of ethnic-inspired entrees and pasta, introduction of "value meals" at hamburger places, the mature pizza market, the increased consumption of coffee and premium beer, and the increasing popularity of coffee bars. These topics are of interest to restaurateurs, nutritionists, and food policymakers.

Nutritional concerns change over time, influencing promotions and menu concepts. Nutritionists can encourage healthier eating in restaurants by promoting wider selections of healthy offerings within the food service industry and by informing consumers of their availability. Food policymakers can design public programs based on the food expenditure patterns of various subgroups of the population.

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# Relationship Between Cigarette Smoking and Other High-Risk Behaviors Among Our Nation's Youth

One of the objectives included in the National Health Objectives for the Year 2000 is a reduction in smoking prevalence among adolescents. Cigarette smoking almost always begins in the adolescent years, increasing the risk of diseases attributable to smoking. Previous research, based on samples of youth who were in school, suggests that many high-risk behaviors among adolescents are interrelated. This report expands upon earlier research by focusing on adolescents in the general household population of the United States, including youth who have left school either prematurely or by graduating.

Data are from the 1992 National Health Interview Survey of Youth Risk Behavior (NHIS-YRBS). The NHIS is a continuous, nationwide, household survey of the civilian noninstitutionalized population of the United States, conducted by the National Center for Health Statistics. Each year special topics are added to the basic NHIS; in 1992, youth risk behavior was the special topic.

NHIS-YRBS interviews were completed for 10,645 youth, age 12 to 21, using an audiocassette technology that ensured greater privacy and increased data quality for youth with poor reading skills. Prevalence estimates for selected high-risk behaviors are presented according to smoking status.

## High-Risk Behaviors

The high-risk behaviors are: Drinking alcohol; consuming more than five alcoholic beverages in a row; using marijuana, cocaine, and smokeless tobacco; carrying weapons; physical fighting; sexual intercourse; failure to use a seat belt; lack of exercise; and consumption of less than five servings of fruits and vegetables daily.

## Smoking Status

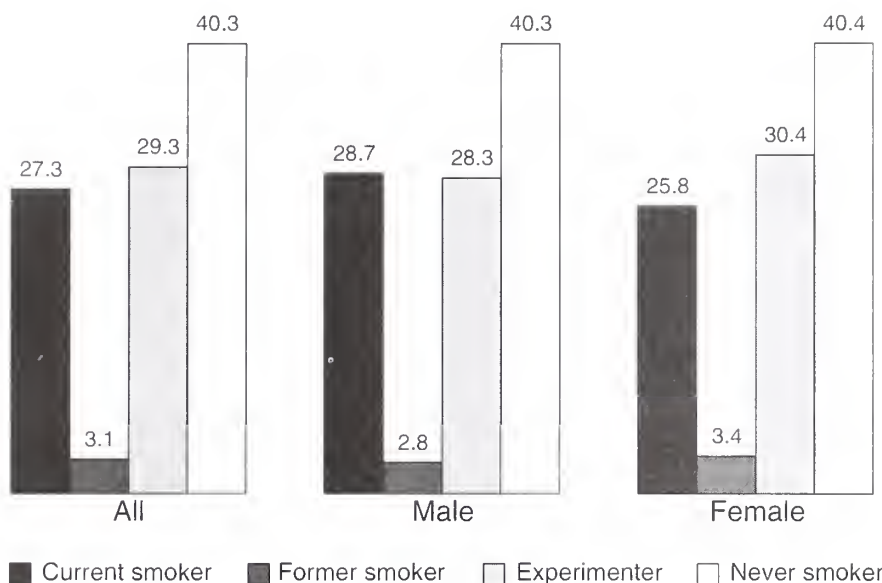
Current smokers were defined as youth who had smoked at least one cigarette in the past 30 days. Former smokers were those who smoked at least one cigarette every day for 30 days at some time in their lives but had not smoked in the past month. Experimenters were those who smoked at least one or two puffs of a cigarette but had never smoked cigarettes every day for 30 days and had not used cigarettes in the past 30 days. Never smokers were those who never had even one or two puffs of a cigarette.

## Findings

In 1992, about 29 percent of male youth and 26 percent of female youth were current smokers, and about 3 percent of both sexes were former smokers (see figure, p. 42). About 28 percent of male youth and about 30 percent of female youth were experimenters, and about 40 percent of both sexes were never smokers.

In general, youth who had never smoked were significantly less likely to have engaged in each high-risk behavior studied than were current smokers. With few exceptions, never smokers were also less likely than former smokers or experimenters to engage in high-risk behaviors. Among both male and female

## Percent of youth 12-21 years of age by smoking status and gender: United States, 1992



Source: Willard, J.C. and Schoenborn, C.A., 1995, *Relationship between cigarette smoking and other unhealthy behaviors among our Nation's youth: United States, 1992*, Advance Data 263:1-11. U.S. Department of Health and Human Services, Public Health Service.

youth, failure to eat at least five servings of fruits and vegetables daily had the highest prevalence of the high risk behaviors studied (see table).

Of adolescent current smokers, 78 percent had consumed alcohol in the past 30 days, compared with 18 percent of never smokers. Among current smokers, prevalence of alcohol consumption in the past month was about the same for males and females. Among never smokers, males were slightly more likely than females to have consumed alcohol in the past month. Of current smokers, 54 percent had five or more alcoholic drinks in a row in the past month, compared with 29 percent of former smokers, 23 percent of experimenters, and 7 percent of never smokers.

Smoking marijuana in the previous 30 days was reported by 29 percent of current smokers, 12 percent of former smokers, 7 percent of experimenters, and 1 percent of never smokers.

Cocaine use in the previous month was reported by 4 percent of current smokers; although data for the other three groups did not meet reliability standards, patterns indicate that prevalence may be lower.

The use of smokeless tobacco (chewing tobacco and snuff) is often taken up during the adolescent years. Males who were current smokers (28 percent) and former smokers (29 percent) were much more likely to have used smokeless tobacco in the past month than males who had never smoked (4 percent). (Estimates for female use of smokeless

tobacco were unreliable because of the small number reporting.)

About 23 percent of youth who were current smokers reported carrying a weapon such as a gun, knife, or club during the previous month, compared with 9 percent of youth who had never smoked. Adolescent male current smokers (35 percent) were more than twice as likely as male never smokers (16 percent) to have carried a weapon, and adolescent female current smokers (10 percent) were more than four times as likely as female never smokers (2 percent) to have carried a weapon. Male and female current smokers were also more likely than the other three groups to have been involved in a physical fight in the past year.

For data on sexual intercourse, the sample was limited to those ages 14-21 who had never been married. Of these youth, 61 percent had engaged in sexual intercourse at some time in their lives. Current smokers (82 percent) and former smokers (82 percent) were more likely to have engaged in sexual intercourse than experimenters (62 percent) or never smokers (38 percent).

When riding in a car, 66 percent of adolescents did not always use seat belts. Of current smokers, 76 percent did not always use a seat belt, compared with 58 percent of never smokers, with the other two groups falling in between.

Youth reported how often in the past week they engaged in a vigorous activity—one that made them sweat or breathe hard. The prevalence of regular (3 or more days a week), vigorous exercise among adolescents was low (46 percent) regardless of smoking status.

**Percent of youth ages 12-21 who engaged in selected high-risk behaviors by type of behavior and smoking status: United States, 1992**

High-risk behavior <sup>1</sup>	All smoking statuses	Current smoker	Former smoker	Experimenter	Never smoker
Drank alcohol	44.6	77.9	55.5	48.7	17.6
Had five or more drinks in a row	25.6	54.5	28.8	23.4	6.8
Used marijuana	10.7	29.1	11.7	6.8	1.1
Used cocaine	1.2	3.9	*	*	*
Used smokeless tobacco	7.5	16.1	14.2	6.2	2.1
Carried a weapon	14.5	23.2	18.9	13.3	9.2
Engaged in physical fight in past year	38.6	48.7	42.3	36.2	33.2
Ever had sexual intercourse <sup>2</sup>	60.8	81.7	82.4	61.8	37.9
Did not always use seat belt	65.8	75.5	67.2	66.9	58.4
Exercised vigorously fewer than 3 times in past week <sup>3</sup>	46.2	54.4	55.3	46.1	40.1
Ate fewer than five servings of fruits and vegetables yesterday	87.0	89.8	91.3	89.2	83.1

<sup>1</sup>Reference period is past 30 days unless otherwise specified.

<sup>2</sup>Ages 14-21 and never married.

<sup>3</sup>Vigorous is defined as exercise that made the youth sweat and breathe hard.

\*Data were unreliable because of the small number reporting.

Source: Willard, J.C. and Schoenborn, C.A., 1995, *Relationship between cigarette smoking and other unhealthy behaviors among our Nation's youth: United States, 1992, Advance Data 263:1-11*. U.S. Department of Health and Human Services, Public Health Service.

Guidelines for healthy eating recommend eating five or more servings of fruits and vegetables daily. Overall, 87 percent of all adolescents consumed less than five servings of fruits and vegetables the day preceding the interview. Adolescents who currently smoked were more likely to consume fewer than five fruits and vegetables than were never smokers (90 vs. 83 percent).

## Conclusions

For nearly every kind of high-risk behavior studied, current smokers had the highest rates of other risk behaviors, and never smokers had the lowest rates. The data presented suggest that youth who engage in some high-risk behaviors are likely to engage in others. Interventions that target multiple high-risk behaviors may be more helpful in

getting youth to adopt healthy behaviors than programs that target a single behavior.

Source: Willard, J.C. and Schoenborn, C.A., 1995, *Relationship between cigarette smoking and other unhealthy behaviors among our Nation's youth: United States, 1992, Advance Data 263:1-11*. U.S. Department of Health and Human Services, Public Health Service.

# How Does Living Alone Affect Dietary Quality?

Using data from the 1987-88 Nationwide Food Consumption Survey (NFCS), this report compares the dietary quality of adults who live alone with that of adults who live in multiperson households. According to the U.S. Bureau of the Census, 25 percent of American households consisted of single persons in 1990, up from 17 percent in 1970.

The NFCS, which has been conducted by the U.S. Department of Agriculture (USDA) since 1955, collects information on individual and household characteristics as well as food and nutrient intakes from households in the 48 contiguous States. The 1987-88 survey—the most recent—was designed as a self-weighted sample of the American population. However, the response rate was much lower than expected (under 35 percent), which raised a concern about the representativeness of the sample. Although a weighting scheme was developed to adjust for nonresponse, the possibility of nonresponse bias may still exist. Therefore, results reported here cannot be generalized to the American population.

Dietary quality was measured in terms of total energy intake, nutrient intake,<sup>1</sup> nutrient density (amount of nutrient per 1,000 kilocalories), and the contribution of each food group to the total diet. In addition, dietary quality of the two household types was compared in terms of weekly food expenditure and selected demographic, socioeconomic, and diet- and health-related characteristics.

<sup>1</sup>Dietary nutrients exclude supplements, which were reported separately.

## Nutrient Intakes

The diets of adults living alone were significantly lower in food energy, protein, total fat, saturated fatty acids, calcium, phosphorus, and sodium than the diets of adults living in multiperson households. In addition, single women also had significantly lower intakes of thiamin, niacin, and zinc and

significantly higher intakes of vitamin A. Nutrients that show significant differences vary by age as well as sex (tables 1 and 2).

Nutrient intakes of both single women and single men in each age group were generally lower than those of their counterparts in multiperson households. Exceptions were intakes of vitamin A,

**Table 1. Nutrient intakes: Women living alone as compared with women living with others**

Nutrient	Age (years)					
	All ages	19 - 34	35 - 54	55 - 64	65 - 74	75+
Food energy	L	L	—	—	—	—
Carbohydrate	—	—	—	—	—	—
Protein	L	L	—	L	—	L
Fat	L	L	—	L	—	—
Saturated fat	L	L	L	—	—	—
Vitamin A	H	—	—	H	—	—
Carotenes	—	—	—	—	—	—
Vitamin C	—	—	—	—	—	—
Vitamin E	—	—	—	—	—	—
Thiamin	L	L	—	—	—	—
Riboflavin	—	L	—	—	—	—
Niacin	L	L	—	—	—	—
Vitamin B-6	—	L	—	—	—	—
Vitamin B-12	—	—	—	—	—	—
Folate	—	—	—	—	—	—
Phosphorus	L	L	—	—	—	—
Calcium	L	L	—	—	—	—
Magnesium	—	—	—	—	—	—
Iron	—	L	—	—	—	—
Zinc	L	L	—	L	—	—
Cholesterol	—	—	—	—	—	—
Fiber	—	—	—	—	—	—
Sodium	L	L	—	—	—	L

L = significantly lower; H = significantly higher. From weighted mean 3-day intakes; significant at  $p < .05$ . Blank cells indicate no statistically significant relation.

Source: Gerrior, S.A., Guthrie, J.F., Fox, J.J., Lutz, S.M., Keane, T.P., and Basiotis, P.P., 1994, *How Does Living Alone Affect Dietary Quality?* U.S. Department of Agriculture, Agricultural Research Service, *Home Economics Research Report No. 51*.

carotenes, vitamin C, and vitamin B-12, which were at least 10 percent higher for single women than for women in multiperson households. For single men, the intakes of total fat, saturated fatty acids, carotenes, calcium, and sodium were lower by at least 10 percent than for men in multiperson households. The higher intakes of vitamin A,

carotenes, and vitamin C by single women and lower intakes of total fat, saturated fatty acids, and sodium by single men in each of the age groups imply that single persons are more willing to follow, or more successful in following, current dietary recommendations for an adequate diet and good health.

**Table 2. Nutrient intakes: Men living alone as compared with men living with others**

Nutrient	Age (years)					
	All ages	19 - 34	35 - 54	55 - 64	65 - 74	75+
Food energy	L	—	—	—	—	—
Carbohydrate	—	—	—	—	—	—
Protein	L	—	—	—	—	L
Fat	L	—	—	—	—	—
Saturated fat	L	L	—	—	—	—
Vitamin A	—	—	—	—	—	—
Carotenes	—	—	—	—	L	—
Vitamin C	—	—	L	—	—	—
Vitamin E	—	—	L	—	L	—
Thiamin	—	—	L	—	—	—
Riboflavin	—	—	—	—	—	—
Niacin	—	—	—	—	—	—
Vitamin B-6	—	—	—	—	—	—
Vitamin B-12	—	L	—	—	—	—
Folate	—	—	—	—	—	—
Phosphorus	L	—	—	—	—	L
Calcium	L	—	L	—	—	L
Magnesium	—	—	—	—	—	—
Iron	—	—	—	—	—	—
Zinc	—	—	H	—	—	L
Cholesterol	—	—	—	—	—	—
Fiber	—	—	—	—	L	—
Sodium	L	—	L	L	—	—

L = significantly lower; H = significantly higher. From weighted mean 3-day intakes; significant at  $p < .05$ . Blank cells indicate no statistically significant relation.

Source: Gerrior, S.A., Guthrie, J.F., Fox, J.J., Lutz, S.M., Keane, T.P., and Basiotis, P.P., 1994, *How Does Living Alone Affect Dietary Quality?* U.S. Department of Agriculture, Agricultural Research Service, Home Economics Research Report No. 51.

## Food Group Contributions

Fruits and vegetables made up a larger portion of the diets of single women (23 percent) than of the diets of women in multiperson households (19 percent). This helps to explain the higher intakes of vitamin A, carotenes, and vitamin C by single women. Women who live alone usually need to consider only their own preferences, whereas women in multiperson households have to consider the tastes of men and children. Since single women can eat more of the foods they prefer, results suggest that women may prefer fruits and vegetables.

Grain and cereal products made less of a contribution to the diets of men living alone than to the diets of men living in multiperson households. However, intakes of nutrients associated with this food group were not significantly lower for single men, with the exception of dietary fiber. In addition, intakes of milk and milk products were lower for single men of all ages and significantly lower for the oldest single men. Milk intake may fluctuate with cereal intake; this relationship between milk and cereals may help to explain the lower intakes of calcium, phosphorus, and protein in single men.

## Nutrient Densities

Single women and single men had diets significantly more nutrient-dense in niacin, vitamin B-6, and folate than did their counterparts in multiperson households. In addition, single women had diets significantly more nutrient-dense in carbohydrates, vitamin A, carotenes, vitamin C, vitamin E, riboflavin, magnesium, iron, and dietary fiber—and less nutrient-dense in total fat and

saturated fatty acids. For virtually all nutrients, densities for single women of all ages were higher than for women in multi-person households with the exceptions of total fat, saturated fatty acids, and sodium.

Single men had diets significantly more nutrient-dense in niacin, vitamin B-6, and folate, and less nutrient-dense in sodium than did their counterparts in multiperson households. The nutrient densities of carbohydrates, vitamin B-6, and folate were at least 10 percent higher for men in single-person households than for men in multiperson households. The difference in carbohydrate density may be related to lower fat and higher carbohydrate intake. Single participants, regardless of sex, tended to have diets less dense in total fat, saturated fatty acids, and sodium, and more dense in carbohydrate, vitamins A and C, and fiber. As with nutrient intakes, this dietary behavior suggests that adults living alone have a greater awareness of current dietary recommendations and make a greater effort to heed such advice than adults living in multiperson households.

## Food Expenditures

Single persons spent an average of 13.4 percent of their household income on food, whereas multiperson households spent 16.1 percent of household income on food. However, as may be expected, per-person food expenditures by singles were 22 percent higher than in multiperson households. Food expenditure per person tends to decrease as household size increases because larger households can take advantage of economies of scale, such as purchasing in bulk.

## Socioeconomic, Demographic, and Diet- and Health-Related Characteristics

Few significant differences were found in the socioeconomic, demographic, and health-related characteristics studied. Supplement use and reported health status had the strongest relation to the dietary quality of adults living in these two types of households.

People living alone used vitamin and mineral supplements more frequently than did people in multiperson households. Two-fifths of the women and one-third of the men in single-person households reported using supplements frequently, whereas only one-third of the women and one-fourth of the men in multiperson households did.

Overall, single women were less likely to rate their health status as excellent or good than were women living in multiperson households. There was no overall significant difference in the reported health status between men living alone and men in multiperson households.

Men and women ages 19-34 who live alone had more years of education than did their counterparts in multiperson households. However, level of education did not appear to relate to improved dietary intakes for either group. In fact, young single women with more years of education had lower intakes for many nutrients than did other single women or women living in multiperson households.

## Summary and Implications

Dietary quality was assessed in terms of three measures: Nutrient intake, nutrient density, and food group contribution to the total diet. By doing so, not only the intakes of many nutrients and foods were considered but also the reliance by individuals on certain food groups. This provides a more comprehensive picture of the dietary behavior of adults than assessing only nutrient intakes.

Results show that lower nutrient intakes do not necessarily mean lower nutrient densities, nor are they necessarily indicative of a diet of poorer quality than one with higher intakes. However, a more nutrient-dense diet may make it easier to obtain adequate absolute amounts of nutrients that need to be consumed to avoid nutrient deficiencies and to obtain adequate kilocalories for normal activity.

These results suggest a positive relationship between nutrient density and absolute nutrient intake of a given nutrient when consumption of foods rich in that nutrient play a major part of the diet. Adults from both single-person and multiperson households had some common problems in meeting dietary guidance objectives. Women had low intakes of calcium, iron, zinc, and dietary fiber, whereas men had high intakes of cholesterol. Both women and men had total fat and saturated fatty acid intakes that were higher than dietary recommendations. All groups would benefit from nutritional intervention programs.

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Source: Gerrior, S.A., Guthrie, J.F., Fox, J.J., Lutz, S.M., Keane, T.P., and Basiotis, P.P., 1994, *How Does Living Alone Affect Dietary Quality?* U.S. Department of Agriculture, Agricultural Research Service, Home Economics Research Report No. 51.

# Household Debt

This article reports on the debt obligations and characteristics of individual U.S. households from 1983 to 1992, using data from the Federal Reserve Board's Survey of Consumer Finances (SCF). This nationally representative survey, conducted in 1983, 1989, and 1992,<sup>1</sup> provides information on the distribution of assets and liabilities, including how broadly or narrowly household debt is distributed across various income and asset groups.

## Incidence of Debt

Most households (73 percent) had some type of debt (including mortgage debt) in 1992; 64 percent had consumer installment debt (table 1, p. 48). The proportion with debt has increased since 1983, with nearly all the increase taking place between 1983 and 1989. During this period, household debt grew considerably faster than income. The next 3 years were a period of recession and subdued recovery, and debt accumulation slowed sharply.

Lower income households were much less likely than middle and upper income households to have debt of any type. In 1992, 48 percent of households with incomes below \$10,000 had debt, compared with at least 80 percent of those with incomes above \$20,000. Although the overall proportion of households with debt changed little between 1989 and 1992, the proportion with incomes over \$30,000 that had debt fell, whereas the proportion with incomes below \$30,000 that had debt rose.

<sup>1</sup>Data from the 1986 survey are not cited because they were not strictly comparable to the other surveys.

The incidence of debt by households was closely linked to their stage in the life cycle. Most households headed by younger people bridge the gap between current income and desired expenditures by borrowing. In contrast, people near or in retirement are more likely to have savings and to have eliminated or decreased their debt obligations. Often they can finance expenditures that exceed income by drawing on savings rather than by borrowing. According to the SCF, the proportion of households having debt fell off sharply after age 54. However, since the 1983 survey, sizable increases in the proportion over age 64 with debt have occurred.

Among homeowners, 78 percent had debt in 1992, compared with 65 percent of renters—nearly all the difference was attributable to mortgage debt. The differences in the proportions of households with debt grouped by race were small. In 1992, the proportion for non-Hispanic Whites exceeded the proportion for non-Whites and Hispanics by only 4 percentage points.

## Amount of Debt

In 1983, the median amount owed by households with debt was \$15,200 (in 1992 dollars). In 1989, the amount owed rose to \$17,600, and remained about the same in 1992. The composition of debt changed, however. Whereas the median amount owed on consumer debt decreased between 1989 and 1992, mortgage obligations increased.

In 1992, indebted households with incomes below \$30,000 typically owed less than \$10,000, but those with incomes over \$100,000 typically owed more than \$100,000. Nearly all the larger debt burdens of higher income households were attributable to their

mortgage obligations. The median amount of consumer debt owed by non-Hispanic White households with debt in 1992 was nearly twice that owed by non-White or Hispanic households, and the amount of total debt was nearly three times as large.

## Share of Debt

Most household debt was owed by upper income households, by households with larger net worths, by households headed by younger or middle-age people, and by homeowners. In 1992, households with incomes over \$50,000 owed two-thirds of total debt, although they accounted for only 27 percent of all households.

Consumer debt, however, was spread much more evenly across households than was total debt. In 1992, households with incomes over \$50,000 held 44 percent of the consumer debt. Homeowners (64 percent of the population) held 72 percent of the consumer debt.

## Repayment of Debt Obligations

The ability of a household to repay its debts can be evaluated by examining ratios of payment obligations to income, changes in those ratios over time, characteristics of households with high ratios, and any difficulties in handling debt payments. The median debt payments-to-income ratio tends to increase with income for households with moderate incomes, then decline for the upper income households (table 2, p. 49). Older households have much lower debt payments-to-income ratios than do younger households, and homeowners have substantially higher debt payments-to-income ratios than do renters.

**Table 1. Proportion of all households having debt, by selected household characteristics and type of debt, 1983, 1989, and 1992**

Household characteristic	1983		1989		1992	
	Consumer debt	Any type of debt	Consumer debt	Any type of debt	Consumer debt	Any type of debt
	<i>Percent</i>					
<b>All households</b>	<b>62</b>	<b>70</b>	<b>65</b>	<b>73</b>	<b>64</b>	<b>73</b>
Income (1992 dollars)						
Less than \$10,000	36	40	42	45	44	48
\$10,000 - \$19,999	48	53	50	54	62	66
\$20,000 - \$29,999	66	72	69	78	72	80
\$30,000 - \$49,999	74	83	77	84	76	83
\$50,000 - \$99,999	78	90	81	93	70	85
\$100,000 - \$249,999	72	85	72	90	60	86
\$250,000 or more	59	78	59	86	50	82
Net worth (1992 dollars)						
Zero or less	64	64	64	64	71	71
\$1 - \$9,999	58	60	60	61	64	65
\$10,000 - \$24,999	67	74	75	78	78	80
\$25,000 - \$49,999	69	75	74	79	70	76
\$50,000 - \$99,999	66	73	69	79	68	75
\$100,000 - \$499,999	61	74	62	76	59	74
\$500,000 or more	52	70	53	73	46	73
Age of head (years)						
Less than 35	74	79	76	80	77	82
35 - 44	79	87	81	90	77	86
45 - 54	71	81	75	86	69	86
55 - 64	57	68	58	72	59	69
65 - 74	32	38	39	50	43	52
75 or more	14	18	18	22	27	30
Housing status						
Owner	64	76	67	79	65	78
Renter or other	59	60	62	62	64	65
Race or ethnicity of head						
Non-Hispanic White	63	71	66	74	64	74
Non-White or Hispanic	61	65	62	68	65	70

Source: Camner, G.B., Kennickell, A.B., and Lockett, C.A., 1995, Household sector borrowing and the burden of debt, Federal Reserve Bulletin 81(4):323-338.

**Table 2. Median ratio of debt payments to income for households with debt, by selected household characteristics, 1983, 1989, and 1992**

Household characteristic	1983	1989	1992
		<i>Percent</i>	
<b>All households</b>	<b>12</b>	<b>15</b>	<b>15</b>
Income (1992 dollars)			
Less than \$10,000	10	13	12
\$10,000 - \$19,999	12	16	15
\$20,000 - \$29,999	12	14	15
\$30,000 - \$49,999	12	16	17
\$50,000 - \$99,999	12	16	16
\$100,000 - \$249,999	9	14	15
\$250,000 or more	5	6	6
Net worth (1992 dollars)			
Zero or less	7	9	9
\$1 - \$9,999	8	10	9
\$10,000 - \$24,999	12	16	17
\$25,000 - \$49,999	15	18	18
\$50,000 - \$99,999	14	18	18
\$100,000 - \$499,999	12	16	16
\$500,000 or more	10	17	16
Age of head (years)			
Less than 35	12	15	15
35 - 44	13	17	18
45 - 54	12	16	16
55 - 64	9	12	14
65 - 74	7	12	10
75 or more	4	8	3
Housing status			
Owner	14	19	19
Renter or other	6	7	6
Race or ethnicity of head			
Non-Hispanic White	12	15	16
Non-White or Hispanic	12	15	13

Source: Canner, G.B., Kennickell, A.B., and Luckett, C.A., 1995, Household sector borrowing and the burden of debt, *Federal Reserve Bulletin* 81(4):323-338.

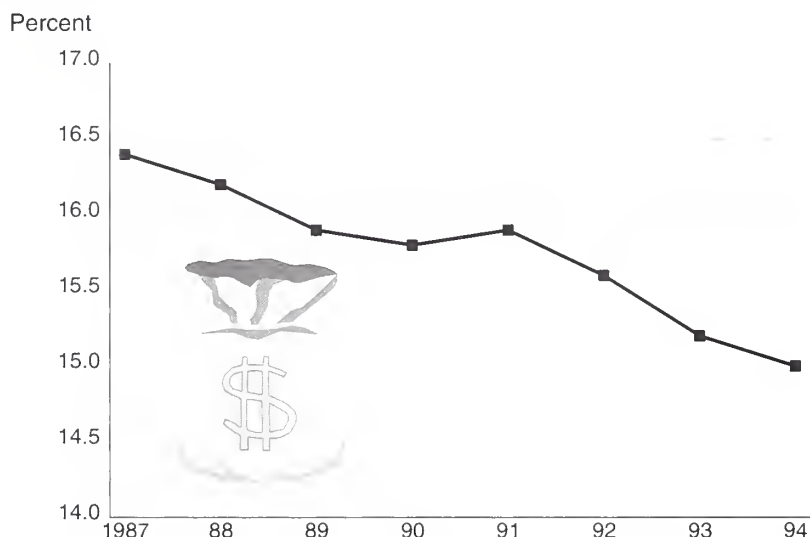
Most households with high ratios of debt payments to income in 1992 were in the lower income groups. Three-fourths of the households with high consumer-debt ratios, and half of the households with high total-debt ratios, had incomes below \$20,000. Forty-two percent of households with high consumer debt payments-to-income ratios and nearly 36 percent of households with high total debt payments-to-income ratios reported having income that was low compared with their usual income. It is possible that a substantial portion of households with high debt-payments ratios were experiencing a temporary situation and expecting income to return to a former level.

Respondents were asked if they had failed to meet a scheduled loan payment during the 12 months preceding the survey, an indicator of the burden that debt payment places on households. The proportion of households reporting late payments rose from 17 percent in 1983 to 21 percent in 1989. Because many consumers cut back on spending and borrowing in the early 1990's, only 15 percent of the indebted households in 1992 had missed a payment. In each survey year, larger proportions of lower and middle income households had missed a scheduled payment. Households with zero or less net worth reported the highest incidence of failure to meet a payment. Younger households consistently had a higher rate of late payments than older households; non-White and Hispanic households had a higher rate of late payments than did non-Hispanic White households.

Source: Canner, G.B., Kennickell, A.B., and Luckett, C.A., 1995, Household sector borrowing and the burden of debt, *Federal Reserve Bulletin* 81(4):323-338.

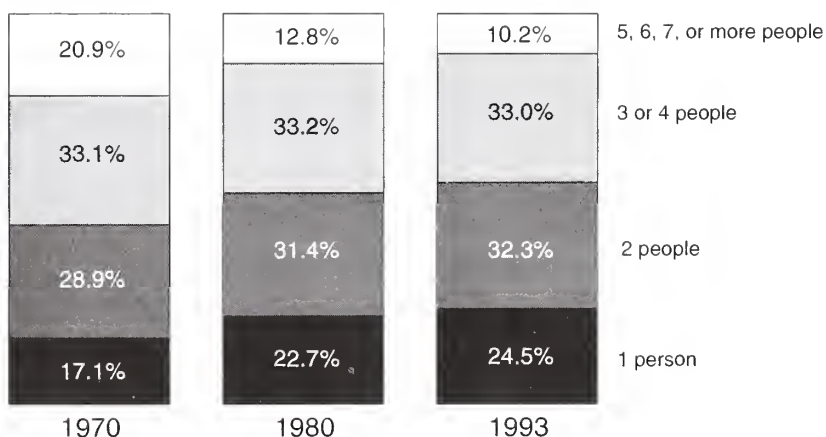
## Charts From Federal Data Sources

### Percentage of personal consumption expenditures allocated for food, 1987-94



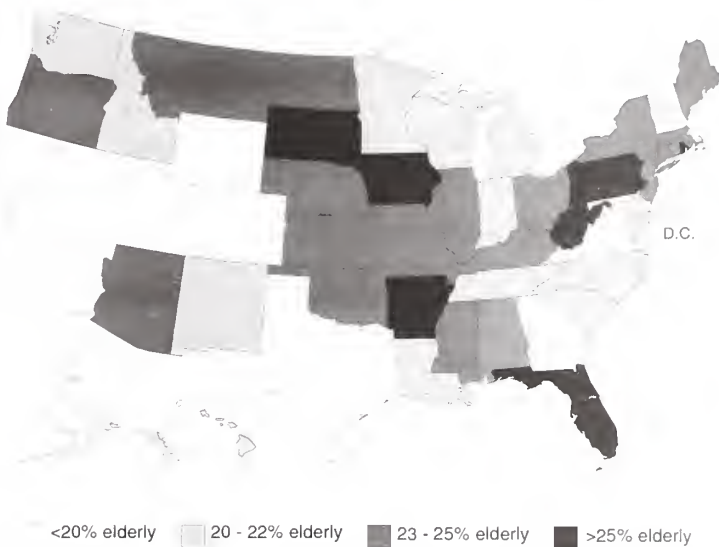
Source: U.S. Department of Commerce, Bureau of Economic Analysis, 1992-95, Survey of Current Business, table 2.3.

### Households, by size: 1970, 1980, and 1993



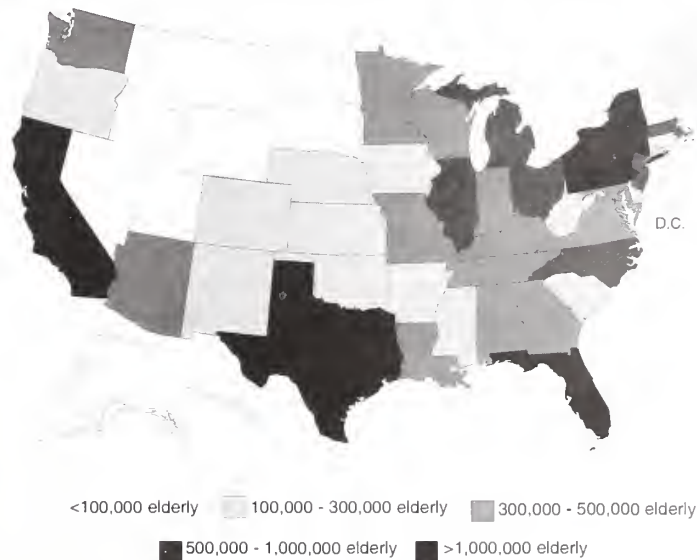
Source: Rawlings, S.W., 1994, Household and family characteristics: March 1993, Current Population Reports, Population Characteristics P20-477, U.S. Department of Commerce, Bureau of the Census.

### Percentage of householders age 65 and over, 1990



Source: U.S. Department of Commerce, Bureau of the Census, 1995, *Housing of the Elderly*, Statistical Brief 94-33.

### Number of householders age 65 and over, 1990



Source: U.S. Department of Commerce, Bureau of the Census, 1995, *Housing of the Elderly*, Statistical Brief 94-33.

## Recent Legislation Affecting Families

**Public Law 104-12 (enacted May 18, 1995)**—the Truth in Lending Class Action Relief Act of 1995 establishes a moratorium on certain class action lawsuits relating to the Truth in Lending Act and involving first and second mortgage loans secured by real property from May 18, 1995 to October 1, 1995.

**Public Law 104-13 (enacted May 22, 1995)**—Furtheres the goals of the Paperwork Reduction Act to have Federal agencies become more responsible and publicly accountable for reducing the burden of Federal paperwork on the public. The act sets a governmentwide paperwork reduction goal of 10 percent in each of the first 2 years of the law and a 5-percent goal from fiscal 1998 through fiscal 2001. The legislation reauthorizes the Office of Information and Regulatory Affairs for 6 years and subjects all paperwork requirements to review.

**Public Law 104-16 (enacted June 21, 1995)**—Extends for 2 years the Indian Child Protection and Family Violence Prevention Act, which provides prevention and mental health treatment for child abuse and family violence on Indian reservations.

**Public Law 104-18 (enacted July 7, 1995)**—amends title XVIII of the Social Security Act to permit Medicare SELECT policies to be offered in all States. The law extends the date to which any State may issue a Medicare SELECT policy to June 30, 1998. The Omnibus Budget Reconciliation Act of 1990 (OBRA 1990) established a demonstration project under which insurers could market a Medigap product known

as Medicare SELECT. SELECT policies are the same as other Medigap policies except that they may only pay in full for supplemental benefits if covered services are provided through designated health professionals and facilities known as preferred providers. OBRA 1990 limited the SELECT demonstration project to 3 years (1992-94) and to 15 States. The Social Security Amendments of 1994 (Public Law 103-432) extended the project for 6 months, through June 30, 1995. Current enrollees in Medicare SELECT pay significantly reduced premiums compared with those of traditional fee-for-service Medigap policies. If the program had been allowed to expire, no additional individuals would have been allowed to enroll in SELECT plans. This would likely result in significant increases in premiums for current enrollees as those remaining in the pool age and costs increase.

**Public Law 104-19 (enacted July 27, 1995)**—makes emergency supplemental appropriations for additional disaster assistance, for anti-terrorism initiatives, and for assistance in the recovery from the tragedy that occurred in Oklahoma City. The law also stipulates rescissions for the fiscal year ending September 30, 1995. Of funds made available to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) under Public Law 103-111, \$20 million are rescinded.

## Research and Evaluation Activities in USDA

### From the Office of Analysis and Evaluation (OAE), Food and Consumer Service

#### *OAE Conference:*

#### *Charting the Course for Evaluation: How Do We Measure the Success of Nutrition Education and Promotion in Food Assistance Programs?*

In July 1995, the Office of Analysis and Evaluation held a conference to explore the state of the art in program evaluation for nutrition education and promotion programs. The audience—which numbered about 250 people—came from all around the country, Puerto Rico, the Virgin Islands, and Canada. Speakers presented a full range of issues, challenges, techniques and examples of interventions, and their evaluations. They represented government, academia, private consulting, and industry. The following 10 points summarize the common themes at the conference:

1. It is possible to change behavior and to measure behavior change, and good examples abound.
2. Evaluation is integral to health behavior interventions, not an add on. If you can afford to do the intervention, you can afford to do the evaluation.
3. While outcome evaluations serve the needs of policy decision makers, process evaluations are important tools for program refinement and replication.
4. To ensure consistency in theoretical grounding and that the intervention will produce the information necessary for the evaluation, program planners and evaluators must work together from the beginning.
5. The multidimensional nature of interventions—and the behaviors they address—requires that evaluators recognize environmental variables that ultimately bring about behavior change. Intermediate measures, therefore, are important indicators.
6. Model outcome evaluations exist that can serve as proxy measures for other evaluations. In this case, evaluators can concentrate on process measures to improve the quality of the intervention and have confidence in the quality of the outcomes.
7. The elegance of the evaluation should match the complexity of the intervention.
8. Desired outcomes should reflect realistic expectations of the intervention, the target audience, and the nature of behavior change. Behavior changes over decades, not fiscal years, and often in small, though significant, increments.
9. Evaluators should keep the target audience and their needs in mind: Decision makers, nutrition practitioners, researchers, etc.
10. Evaluators can share methods and instruments that have been proven to work.

The conference proceedings will be available in 1996.

#### *Monograph:*

#### *The Effectiveness of Nutrition Education and Implications for Nutrition Education Policy, Programs and Research, by Isobel Contento*

OAE commissioned this monograph, which appears in the November/December 1995 issue of the *Journal of Nutrition Education*. The monograph synthesizes six papers, also funded by OAE, that reviewed a total of 205 research articles on nutrition education interventions. The monograph addresses the following questions:

- Does nutrition education work? If so, what are the successful elements across interventions?
- What are the implications of the findings for nutrition education policy, program implementation, research, and demonstrations?

Each paper reviewed studies of interventions directed at one of six target audiences: Preschool children, school-age children, adults, pregnant women and caretakers of infants, older adults, and trainers and intermediaries in the delivery of nutrition education. The papers reviewed only studies with strong evaluation designs, some measure of instrument reliability and validity, and random assignment or strong quasi-experimental design.

Contento found through this review that “nutrition education ‘works,’ or is a significant factor in improving dietary practices, when behavior change is set as the goal and the educational strategies employed are designed with that as a purpose.” Other elements that contribute

to the effectiveness of nutrition education include:

- Communications for enhancing motivation and awareness, including self-assessment or evaluation, active participation by targeted participants, and mass media health campaigns.
- Behavior change strategies, such as interpersonal and personalized counseling and education, bolstered by social support and approaches that enhance personal control.
- Environmental interventions, such as point-of-choice interventions in grocery stores and eating establishments, and school or worksite interventions.
- Community activation and organization that include active participation of both community leaders and members.

The policy implications that emerge from these elements involve integrating them more thoroughly into interventions and into efforts to evaluate and disseminate the interventions. By doing so, government and community leaders can facilitate access to successful interventions through direct distribution and mass media; extend the reach of interventions into schools, worksites, and other appropriate environments; and promote active community involvement. Research in turn can further this integration by providing information on successes and on diverse target audiences—as well as a deeper understanding of how particular success elements work (alone and in various combinations)—in different environments and with different ethnic, cultural, and age groups. Finally, the monograph stresses the importance of evaluation in each intervention and calls for more effective tools to measure dietary intake and adequacy.

### *Evaluation: Expedited Service in the Food Stamp Program*

The Food Stamp Act required that certain eligible households—those with less than \$150 in gross income and \$100 or less in resources or migrant and seasonal farmworker households with \$100 or less in resources—receive their benefits within 5 days of application. To this list, the Stewart B. McKinney Homeless Assistance Act of 1987 added households in which all members are homeless and households at risk of becoming homeless because their income and resources are less than their monthly shelter costs. State and local officials contend that expedited service rules place an undue burden on caseworkers, lead to increased errors, and do not effectively target those with the greatest immediate need. This evaluation provides some perspective on some of the controversial aspects of expedited service. In particular, the study found that:

- Thirty-five percent of all applicant households receive expedited service—about 2 million households in Fiscal Year 1992. Although most applicants are correctly assigned for expedited or regular processing, about 18 percent are not. Two-thirds of these are households who do not receive expedited service when they should, and the remainder receive expedited processing but do not qualify based on information in their case files.
- Only 10 percent of all expedited service cases are eligible for expedited service solely because all members are homeless or at risk of becoming homeless.

- Expedited service appears to have only small impacts on administrative costs.
- Expedited service cases are not more prone to error than other cases, nor do they affect the error rate for regularly processed cases.
- Expedited service cases generally face economic circumstances that are much more severe than those of applicants receiving regular processing.
- Households at risk of becoming homeless were the group most likely to receive expedited processing in error and also the group most likely to receive regular processing when eligible for expedited service.

OAE currently has copies of the published report available.

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## From the Beltsville Human Nutrition Research Center, Agricultural Research Service

A new report, *Food and Nutrient Intakes by Individuals in the United States, 1 Day, 1989-91*—based on the Continuing Survey of Food Intakes by Individuals, 1989-91, a nationwide food survey—was released in September 1995.

This publication contains estimates of food and nutrient intakes by individuals residing in households in the 48 conterminous States and Washington, DC. The estimates are based on information provided by 15,128 individuals who participated in the 1989-91 Continuing Survey of Food Intakes by Individuals conducted by the U.S. Department of Agriculture.

One-day food and nutrient intake data for individuals of all ages were collected between April 1989 and March 1992 using a 1-day recall in an in-person interview. Food and nutrient intake estimates are tabulated for individuals by sex and age, race, Food Stamp Program participation, poverty status, income level, and region. For 71 food groups and subgroups, mean quantities of foods eaten per individual in a day and percentages of individuals who reported eating any food from the specified food groups and subgroups are presented.

Also presented are tables of the mean intakes of food energy and nutrients; nutrient intakes per 1,000 kilocalories; nutrient intakes expressed as percentages of the 1989 Recommended Dietary Allowances; macronutrient sources of

food energy; frequency of eating; percentage of individuals reporting specified eating occasions; mean intakes and percentages of individuals reporting drinking plain water; percentages of individuals reporting special diets by type of diet; usage of vitamin and mineral supplements by type of supplement; and frequency of salting food at the table.

While supplies last, single copies of this publication—NFS Report No. 91-2 (263 pp.)—may be obtained at no cost from the Agricultural Research Service, USDA, Survey Systems/Food Consumption Laboratory, 4700 River Road, Unit 83, Riverdale, MD 20737. Also, copies of this publication may be purchased from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

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### Would you like to publish in *Family Economics and Nutrition Review*?

*Family Economics and Nutrition Review* will consider for publication articles concerning economic and nutritional issues related to the health and well-being of families. We are especially interested in studies about U.S. population groups at risk—from either an economic or nutritional perspective. Research may be based on primary or secondary data as long as it is national or regional in scope or of national policy interest, and articles may use descriptive or econometric techniques. Manuscripts may be mailed to: Joan C. Courtless, Editor, Center for Nutrition Policy and Promotion. See page 67 for guidelines and complete address.

### Estimated annual expenditures\* on a child by husband-wife families, overall United States, 1994

Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>†</sup>
<b>Income: Less than \$32,800 (Average=\$20,600)</b>								
0-2	\$5,100	\$1,920	\$750	\$740	\$380	\$340	\$560	\$410
3-5	5,390	1,950	850	760	380	340	630	480
6-8	5,670	1,870	1,070	990	450	390	310	590
9-11	5,200	1,530	1,270	830	450	430	190	500
12-14	5,650	1,570	1,250	1,040	720	400	120	550
15-17	6,420	1,590	1,520	1,310	730	480	230	560
Total	\$100,290	\$31,290	\$20,130	\$17,010	\$9,330	\$7,140	\$6,120	\$9,270
<b>Income: \$32,800-\$55,500 (Average=\$43,700)</b>								
0-2	\$7,070	\$2,630	\$890	\$1,110	\$450	\$420	\$890	\$680
3-5	7,460	2,670	1,050	1,140	440	420	990	750
6-8	7,660	2,590	1,300	1,360	520	490	540	860
9-11	7,160	2,240	1,530	1,210	520	530	360	770
12-14	7,590	2,280	1,530	1,410	830	500	230	810
15-17	8,500	2,310	1,790	1,700	840	580	460	820
Total	\$136,320	\$44,160	\$24,270	\$23,790	\$10,800	\$8,820	\$10,410	\$14,070
<b>Income: More than \$55,500 (Average=\$81,500)</b>								
0-2	\$10,510	\$4,150	\$1,230	\$1,370	\$600	\$500	\$1,390	\$1,270
3-5	10,940	4,190	1,400	1,400	600	500	1,510	1,340
6-8	11,020	4,110	1,650	1,620	690	580	920	1,450
9-11	10,500	3,770	1,920	1,470	690	630	660	1,360
12-14	10,940	3,800	1,930	1,680	1,090	590	450	1,400
15-17	12,110	3,830	2,190	1,970	1,110	690	910	1,410
Total	\$198,060	\$71,550	\$30,960	\$28,530	\$14,340	\$10,470	\$17,520	\$24,690

\*Estimates are based on the 1990 Consumer Expenditure Survey updated to 1994 dollars using the CPI. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child, so to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.26. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.78. For expenses on all children in a family, these totals should be summed. For example, annual expenditures on three children ages 10, 13, and 16 in a husband-wife family in the middle income group for the overall United States would be \$18,140 [(\$7,160 + \$7,590 + \$8,500) x 0.78].

<sup>†</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

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**Estimated annual expenditures\* on a child by husband-wife families, urban West,<sup>†</sup> 1994**

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Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>‡</sup>
<b>Income: Less than \$32,900 (Average=\$20,600)</b>								
0-2	\$5,600	\$2,280	\$790	\$840	\$370	\$300	\$580	\$440
3-5	5,900	2,310	890	870	370	300	650	510
6-8	6,170	2,250	1,110	1,090	440	340	310	630
9-11	5,790	1,970	1,330	940	440	370	200	540
12-14	6,140	1,950	1,300	1,150	700	340	120	580
15-17	6,940	2,000	1,570	1,420	710	410	240	590
Total	\$109,620	\$38,280	\$20,970	\$18,930	\$9,090	\$6,180	\$6,300	\$9,870
<b>Income: \$32,900 to \$55,700 (Average=\$43,900)</b>								
0-2	\$7,620	\$2,990	\$940	\$1,230	\$440	\$380	\$930	\$710
3-5	7,980	3,020	1,090	1,260	440	370	1,020	780
6-8	8,210	2,970	1,360	1,480	520	430	550	900
9-11	7,770	2,680	1,600	1,320	520	470	370	810
12-14	8,120	2,660	1,580	1,540	810	440	240	850
15-17	9,100	2,720	1,860	1,820	830	520	490	860
Total	\$146,400	\$51,120	\$25,290	\$25,950	\$10,680	\$7,830	\$10,800	\$14,730
<b>Income: More than \$55,700 (Average=\$81,700)</b>								
0-2	\$11,000	\$4,430	\$1,260	\$1,500	\$590	\$460	\$1,460	\$1,300
3-5	11,410	4,460	1,430	1,520	590	460	1,580	1,370
6-8	11,510	4,400	1,700	1,750	680	530	960	1,490
9-11	11,010	4,110	1,970	1,590	680	570	690	1,400
12-14	11,390	4,100	1,970	1,800	1,060	540	480	1,440
15-17	12,610	4,150	2,240	2,100	1,080	620	970	1,450
Total	\$206,790	\$76,950	\$31,710	\$30,780	\$14,040	\$9,540	\$18,420	\$25,350

\*Estimates are based on the 1990 Consumer Expenditure Survey updated to 1994 dollars using the regional CPI. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child, so to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.26. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.78. For expenses on all children in a family, these totals should be summed.

<sup>†</sup>The Western region consists of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

<sup>‡</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

**Estimated annual expenditures\* on a child by husband-wife families, urban Northeast,<sup>†</sup> 1994**

Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>‡</sup>
<b>Income: Less than \$32,900 (Average=\$20,600)</b>								
0-2	\$5,260	\$2,120	\$850	\$720	\$380	\$330	\$440	\$420
3-5	5,540	2,150	950	750	370	330	500	490
6-8	5,910	2,090	1,190	980	450	370	230	600
9-11	5,560	1,810	1,410	820	450	410	140	520
12-14	5,930	1,790	1,380	1,030	710	380	80	560
15-17	6,710	1,850	1,660	1,300	720	450	160	570
Total	\$104,730	\$35,430	\$22,320	\$16,800	\$9,240	\$6,810	\$4,650	\$9,480
<b>Income: \$32,900 to \$55,700 (Average=\$43,900)</b>								
0-2	\$7,220	\$2,840	\$990	\$1,110	\$440	\$420	\$730	\$690
3-5	7,580	2,870	1,150	1,140	440	410	810	760
6-8	7,900	2,810	1,430	1,370	520	470	420	880
9-11	7,500	2,520	1,680	1,210	520	510	270	790
12-14	7,900	2,510	1,660	1,430	820	480	170	830
15-17	8,790	2,560	1,940	1,710	840	560	340	840
Total	\$140,670	\$48,330	\$26,550	\$23,910	\$10,740	\$8,550	\$8,220	\$14,370
<b>Income: More than \$55,700 (Average=\$81,800)</b>								
0-2	\$10,530	\$4,280	\$1,310	\$1,380	\$590	\$500	\$1,190	\$1,280
3-5	10,950	4,310	1,490	1,410	590	500	1,300	1,350
6-8	11,110	4,250	1,760	1,630	680	570	750	1,470
9-11	10,690	3,960	2,040	1,480	680	620	530	1,380
12-14	11,120	3,950	2,050	1,690	1,070	580	360	1,420
15-17	12,200	4,000	2,310	1,980	1,090	670	720	1,430
Total	\$199,800	\$74,250	\$32,880	\$28,710	\$14,100	\$10,320	\$14,550	\$24,990

\*Estimates are based on the 1990 Consumer Expenditure Survey updated to 1994 dollars using the regional CPI. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child, so to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.26. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.78. For expenses on all children in a family, these totals should be summed.

<sup>†</sup>The Northeast region consists of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

<sup>‡</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

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**Estimated annual expenditures\* on a child by husband-wife families, urban South,<sup>†</sup> 1994**

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Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>‡</sup>
<b>Income: Less than \$32,700 (Average=\$20,500)</b>								
0–2	\$5,000	\$1,880	\$710	\$600	\$410	\$400	\$620	\$380
3–5	5,280	1,910	810	620	400	390	700	450
6–8	5,560	1,850	1,020	850	480	450	350	560
9–11	5,150	1,570	1,220	690	480	490	220	480
12–14	5,520	1,550	1,190	900	760	460	140	520
15–17	6,350	1,610	1,460	1,160	770	540	280	530
Total	\$98,580	\$31,110	\$19,230	\$14,460	\$9,900	\$8,190	\$6,930	\$8,760
<b>Income: \$32,700 to \$55,300 (Average=\$43,600)</b>								
0–2	\$7,020	\$2,580	\$860	\$980	\$480	\$490	\$980	\$650
3–5	7,370	2,610	1,010	1,010	480	480	1,070	710
6–8	7,590	2,560	1,260	1,230	560	560	590	830
9–11	7,140	2,270	1,490	1,070	560	600	410	740
12–14	7,510	2,260	1,460	1,290	880	570	270	780
15–17	8,480	2,310	1,730	1,560	900	650	540	790
Total	\$135,330	\$43,770	\$23,430	\$21,420	\$11,580	\$10,050	\$11,580	\$13,500
<b>Income: More than \$55,300 (Average=\$81,300)</b>								
0–2	\$10,380	\$4,010	\$1,180	\$1,240	\$640	\$580	\$1,500	\$1,230
3–5	10,770	4,040	1,340	1,270	640	570	1,620	1,290
6–8	10,890	3,980	1,590	1,490	740	670	1,010	1,410
9–11	10,390	3,700	1,860	1,340	730	710	730	1,320
12–14	10,790	3,680	1,850	1,550	1,150	680	520	1,360
15–17	12,050	3,740	2,110	1,830	1,180	770	1,050	1,370
Total	\$195,810	\$69,450	\$29,790	\$26,160	\$15,240	\$11,940	\$19,290	\$23,940

\*Estimates are based on the 1990 Consumer Expenditure Survey updated to 1994 dollars using the regional CPI. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child, so to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.26. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.78. For expenses on all children in a family, these totals should be summed.

<sup>†</sup>The Southern region consists of Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

<sup>‡</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

**Estimated annual expenditures\* on a child by husband-wife families, urban Midwest,<sup>†</sup> 1994**

Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>‡</sup>
<b>Income: Less than \$32,700 (Average=\$20,500)</b>								
0-2	\$4,730	\$1,790	\$670	\$650	\$360	\$310	\$550	\$400
3-5	4,990	1,820	760	670	360	310	610	460
6-8	5,280	1,770	960	890	430	350	300	580
9-11	4,880	1,480	1,170	740	430	380	190	490
12-14	5,230	1,460	1,130	950	690	360	110	530
15-17	6,030	1,520	1,400	1,210	700	430	230	540
Total	\$93,420	\$29,520	\$18,270	\$15,330	\$8,910	\$6,420	\$5,970	\$9,000
<b>Income: \$32,700 to \$55,300 (Average=\$43,600)</b>								
0-2	\$6,710	\$2,500	\$820	\$1,030	\$430	\$390	\$880	\$660
3-5	7,070	2,530	970	1,060	420	390	970	730
6-8	7,270	2,470	1,210	1,280	500	440	520	850
9-11	6,830	2,190	1,430	1,120	500	480	350	760
12-14	7,190	2,170	1,410	1,330	800	450	230	800
15-17	8,130	2,230	1,680	1,610	810	530	460	810
Total	\$129,600	\$42,270	\$22,560	\$22,290	\$10,380	\$8,040	\$10,230	\$13,830
<b>Income: More than \$55,300 (Average=\$81,200)</b>								
0-2	\$10,030	\$3,920	\$1,140	\$1,290	\$570	\$480	\$1,380	\$1,250
3-5	10,430	3,950	1,300	1,320	570	470	1,500	1,320
6-8	10,530	3,900	1,550	1,540	660	540	900	1,440
9-11	10,050	3,610	1,810	1,380	660	590	650	1,350
12-14	10,440	3,600	1,800	1,600	1,050	550	450	1,390
15-17	11,620	3,650	2,060	1,880	1,070	640	920	1,400
Total	\$189,300	\$67,890	\$28,980	\$27,030	\$13,740	\$9,810	\$17,400	\$24,450

\*Estimates are based on the 1990 Consumer Expenditure Survey updated to 1994 dollars using the regional CPI. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child, so to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.26. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.78. For expenses on all children in a family, these totals should be summed.

<sup>†</sup>The Midwest region consists of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

<sup>‡</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

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**Estimated annual expenditures\* on a child by husband-wife families, rural areas,<sup>†</sup> 1994**

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Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>‡</sup>
<b>Income: Less than \$32,600 (Average=\$20,500)</b>								
0-2	\$4,840	\$1,530	\$760	\$860	\$380	\$360	\$540	\$410
3-5	5,110	1,560	850	890	370	360	610	470
6-8	5,410	1,500	1,070	1,110	450	410	290	580
9-11	5,040	1,220	1,280	950	450	450	190	500
12-14	5,420	1,200	1,250	1,170	730	420	110	540
15-17	6,220	1,260	1,520	1,430	740	490	230	550
Total	\$96,120	\$24,810	\$20,190	\$19,230	\$9,360	\$7,470	\$5,910	\$9,150
<b>Income: \$32,600 to \$55,200 (Average=\$43,500)</b>								
0-2	\$6,820	\$2,240	\$900	\$1,240	\$450	\$450	\$870	\$670
3-5	7,170	2,270	1,050	1,270	440	440	960	740
6-8	7,410	2,210	1,310	1,490	520	510	520	850
9-11	7,010	1,930	1,550	1,340	530	550	350	760
12-14	7,390	1,910	1,530	1,550	850	520	230	800
15-17	8,330	1,970	1,790	1,830	860	610	460	810
Total	\$132,390	\$37,590	\$24,390	\$26,160	\$10,950	\$9,240	\$10,170	\$13,890
<b>Income: More than \$55,200 (Average=\$81,100)</b>								
0-2	\$10,150	\$3,660	\$1,220	\$1,510	\$600	\$540	\$1,380	\$1,240
3-5	10,530	3,690	1,390	1,530	590	530	1,490	1,310
6-8	10,670	3,640	1,640	1,760	690	620	900	1,420
9-11	10,190	3,350	1,910	1,600	690	660	650	1,330
12-14	10,610	3,340	1,910	1,810	1,100	630	450	1,370
15-17	11,800	3,390	2,170	2,110	1,120	720	910	1,380
Total	\$191,850	\$63,210	\$30,720	\$30,960	\$14,370	\$11,100	\$17,340	\$24,150

\*Estimates are based on the 1990 Consumer Expenditure Survey updated to 1994 dollars using the regional CPI. The figures represent estimated expenses on the younger child in a two-child family. Estimates are about the same for the older child, so to calculate expenses for two children, figures should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.26. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.78. For expenses on all children in a family, these totals should be summed.

<sup>†</sup>Rural areas are places of fewer than 2,500 people outside a Metropolitan Statistical Area.

<sup>‡</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

**Estimated annual expenditures\* on a child by single-parent families, overall United States, 1994**

Age of child	Total	Housing	Food	Transportation	Clothing	Health care	Child care and education	Miscellaneous <sup>†</sup>
<b>Income: Less than \$32,800 (Average=\$14,000)</b>								
0-2	\$4,440	\$1,610	\$850	\$720	\$450	\$200	\$400	\$210
3-5	5,110	1,920	880	780	430	290	520	290
6-8	5,880	2,140	1,090	650	550	410	560	480
9-11	5,090	1,950	1,190	600	530	440	130	250
12-14	5,490	1,880	1,230	690	750	440	170	330
15-17	6,560	2,180	1,450	850	1,010	560	160	350
Total	\$97,710	\$35,040	\$20,070	\$12,870	\$11,160	\$7,020	\$5,820	\$5,730
<b>Income: \$32,800 or more (Average=\$49,100)</b>								
0-2	\$9,860	\$3,720	\$1,380	\$1,610	\$600	\$340	\$1,010	\$1,200
3-5	10,680	4,020	1,450	1,680	570	460	1,210	1,290
6-8	11,650	4,250	1,770	1,550	710	630	1,270	1,470
9-11	10,590	4,060	1,980	1,500	680	680	450	1,240
12-14	11,140	3,990	1,980	1,590	950	680	630	1,320
15-17	12,160	4,290	2,200	1,640	1,250	820	620	1,340
Total	\$198,240	\$72,990	\$32,280	\$28,710	\$14,280	\$10,830	\$15,570	\$23,580

\*Estimates are based on data from the 1990 Consumer Expenditure Survey updated to 1994 dollars using the CPI. The figures represent estimated expenses on the younger child in a single-parent, two-child family. For estimated expenses on the older child, multiply the total expense for the appropriate age category by 0.92. To estimate expenses for two children, the expenses on the younger child and older child—after adjusting the expense on the older child downward—should be summed for the appropriate age categories. To estimate expenses for an only child, multiply the total expense for the appropriate age category by 1.37. To estimate expenses for each child in a family with three or more children, multiply the total expense for each appropriate age category by 0.72—after adjusting the expenses on the older children downward. For expenses on all children in a family, these totals should be summed. For example, annual expenditures on three children ages 10, 13, and 16 in a single-parent family in the lower income group for the overall United States would be \$11,650 {[\$5,090 + (\$5,490 x 0.92) + (\$6,560 x 0.92)] x 0.72}.

<sup>†</sup>Miscellaneous expenses include personal care items, entertainment, and reading materials.

# Data Sources

## Health and Diet Survey (HDS)

**Sponsoring agency:** U.S. Department of Health and Human Services

**Population covered:** Civilian, noninstitutionalized adults age 18 and over

**Sample size:** 3,200 to 4,000

**Geographic distribution:** Conterminous United States

**Years data collected:** 1982, 1983-84, 1986, 1988, 1990, 1995

**Method of data collection:** Telephone interviews

**Future surveys planned:** The 1995 survey will be released approximately Spring 1996. Future biennial surveys are planned.

**Major variables:** Age, race, sex, ethnicity, education; household income, number of adults in household, census region; awareness, beliefs, attitudes, knowledge, and reported behaviors regarding food, nutrition, and health; self-reported height and weight, health history, and status.

**Sources for further information and data:**  
Food and Drug Administration  
Center for Food Safety and Applied Nutrition  
Consumer Studies Branch (HFS-727)  
200 C Street, SW  
Washington, DC 20204  
(202) 205-5363

## Food Label Use and Nutrition Education Survey (FLUNES)

**Sponsoring agency:** U.S. Department of Health and Human Services and U.S. Department of Agriculture

**Population covered:** Adults living in households, age 18 and over

**Sample size:** 1,945

**Geographic distribution:** Conterminous United States and the District of Columbia

**Years data collected:** March-April and August-September 1994

**Method of data collection:** Telephone interviews

**Future surveys planned:** None, but certain food label and nutrition education questions from this survey are included in the 1995 Health and Diet Survey to be released in 1996.

**Major variables:** A baseline and tracking survey designed to provide key information for assessing the impact of the Nutrition Labeling and Education Act of 1990 (NLEA) on American consumers. Topics related to food labeling and to the broader dietary context in which people use labels include awareness of dietary risk factors, current diet management practices, relevant beliefs and knowledge, and relevant health status and health-related behaviors. Questions asked previously in Health and Diet Surveys (HDS) were included to track changes in awareness, knowledge, and self-reported behaviors.

**Sources for further information and data:**  
Food and Drug Administration  
Center for Food Safety and Applied Nutrition  
Consumer Studies Branch (HFS-727)  
200 C Street, SW  
Washington, DC 20204  
(202) 205-5363

## Journal Abstracts

The following abstracts are reprinted verbatim as they appear in the cited source.

**Amato, P.R., Rezac, S.J., and Booth, A. 1995.** Helping between parents and young adult offspring: The role of parental marital quality, divorce, and remarriage. *Journal of Marriage and the Family* 57(2):363-374.

Using longitudinal data from a national sample of 471 parents and their adult children, we examined the impact of parental marital quality, divorce, and remarriage on the exchange of assistance between parents and offspring. Low marital quality was not associated with the exchange of help, although it did appear to lower children's tendency to name parents as someone they could go to for aid. Divorce lowered helping between fathers and offspring, but not between mothers and offspring. Single mothers received more and gave less assistance to their children than did mothers in first or later marriages. Remarried mothers gave as much assistance as first-married mothers, but received less assistance. With the exception of parental support for college, when one takes into account that children of divorce have two parental households with which to exchange, they were as likely to receive and give support as children with continuously married parents.

**Feldstein, M. 1995.** College scholarship rules and private saving. *The American Economic Review* 85(3):552-566.

This paper examines the effect of existing college scholarship rules on the incentive to save. The analysis shows that families that are eligible for college scholarships face "education tax rates" on capital income of between 22 percent and 47 percent in addition to regular federal and state income taxes. The empirical analysis developed here, based on the 1986 Survey of Consumer Finances, implies that these high tax rates have a powerful adverse effect on the accumulation of financial assets.

**Fogler-Levitt, E., Lau, D., Csima, A., Krongl, M., and Coleman, P. 1995.** Utilization of home-delivered meals by recipients 75 years of age or older. *Journal of the American Dietetic Association* 95(5):552-557

A study of 137 free-living elderly people (>75 years) who received food from a meals-on-wheels program revealed that men had higher overall meal and nutrient utilization. Women living alone had a higher meal utilization rate than did women living with others. Nutrient utilization was found to be lowest for vitamin C in women and highest for protein and vitamin A in men. Differences in utilization of home-delivered meals in terms of energy and nutrients were more pronounced by gender and, among women, by living situation than by age.

**Hunt, J.R., Kristal, A.R., White, E., Lynch, J.C., and Fries, E. 1995.** Physician recommendations for dietary change: Their prevalence and impact in a population-based sample. *American Journal of Public Health* 85(5):722-726.

A random-digit-dialing survey to examine the prevalence, content, and impact of physician dietary recommendations in a representative population-based sample of Washington State residents was administered to 1972 persons aged 18 years and older. Twenty percent of those surveyed received a physician's recommendation for dietary change in the previous year. The most common recommendations were to decrease intake of cholesterol, calories, and red meat and to increase intake of vegetables and fiber. Respondents receiving recommendations were more likely to report decreased use of high-fat foods and increased use of high-fiber foods and to be in the maintenance stage of dietary change. Results suggest that physicians can play a limited role in promoting dietary change.

# Cost of Food at Home

Cost of food at home estimated for food plans at four cost levels, September 1995, U.S. average<sup>1</sup>

Sex-age group	Cost for 1 week				Cost for 1 month			
	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan
<b>FAMILIES</b>								
Family of 2: <sup>2</sup>								
20 - 50 years . . . . .	\$53.60	\$67.70	\$83.70	\$104.30	\$232.20	\$293.30	\$362.70	\$451.70
51 years and over . . . . .	50.50	65.10	80.60	96.60	218.70	282.00	349.40	418.80
Family of 4:								
Couple, 20 - 50 years and children—								
1 - 2 and 3 - 5 years . . . . .	78.00	97.60	119.50	147.10	338.20	422.80	517.50	637.10
6 - 8 and 9 - 11 years . . . . .	89.60	114.70	143.40	172.90	388.10	497.10	621.50	749.10
<b>INDIVIDUALS<sup>3</sup></b>								
Child:								
1 - 2 years . . . . .	14.10	17.30	20.20	24.50	61.10	74.80	87.40	106.00
3 - 5 years . . . . .	15.20	18.80	23.20	27.80	66.00	81.40	100.40	120.50
6 - 8 years . . . . .	18.70	24.90	31.10	36.10	80.80	107.90	134.70	156.60
9 - 11 years . . . . .	22.20	28.30	36.20	42.00	96.20	122.60	157.10	181.90
Male:								
12 - 14 years . . . . .	22.90	32.00	39.70	46.80	99.40	138.50	172.20	202.60
15 - 19 years . . . . .	23.80	32.90	41.00	47.60	103.00	142.70	177.80	206.10
20 - 50 years . . . . .	25.60	32.70	41.00	49.80	110.90	141.80	177.80	215.80
51 years and over . . . . .	23.10	31.30	38.60	46.30	100.20	135.40	167.30	200.70
Female:								
12 - 19 years . . . . .	23.10	27.60	33.50	40.50	100.00	119.60	145.20	175.50
20 - 50 years . . . . .	23.10	28.80	35.10	45.00	100.20	124.80	151.90	194.80
51 years and over . . . . .	22.80	27.90	34.70	41.50	98.60	121.00	150.30	180.00

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for the thrifty food plan were computed from quantities of foods published in *Family Economics Review* 1984(1). Estimates for the other plans were computed from quantities of foods published in *Family Economics Review* 1983(2). The costs of the food plans are estimated by updating prices paid by households surveyed in 1977-78 in USDA's Nationwide Food Consumption Survey. USDA updates these survey prices using information from the Bureau of Labor Statistics, *CPI Detailed Report*, table 4, to estimate the costs for the food plans.

<sup>2</sup>Ten percent added for family size adjustment. See footnote 3.

<sup>3</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person—add 20 percent; 2-person—add 10 percent; 3-person—add 5 percent; 5- or 6-person—subtract 5 percent; 7- or more-person—subtract 10 percent.

# Consumer Prices

Consumer Price Index for all urban consumers [1982-84 = 100]

Group	Unadjusted indexes			
	September 1995	July 1995	August 1995	September 1994
All items . . . . .	153.2	152.5	152.9	149.4
Food . . . . .	148.9	148.1	148.4	145.0
Food at home . . . . .	149.2	148.2	148.4	145.0
Food away from home . . . . .	149.6	149.1	149.4	146.2
Housing . . . . .	149.5	149.2	149.6	145.8
Shelter . . . . .	166.8	166.4	166.8	161.6
Renters' costs <sup>1</sup> . . . . .	175.1	176.7	176.9	169.4
Homeowners' costs <sup>1</sup> . . . . .	172.4	171.2	171.6	167.1
Household insurance <sup>1</sup> . . . . .	157.0	158.3	158.7	154.3
Maintenance and repairs . . . . .	135.4	135.1	135.4	131.6
Maintenance and repair services . . . . .	140.3	139.8	140.3	135.8
Maintenance and repair commodities . . . . .	128.9	128.7	128.8	126.0
Fuel and other utilities . . . . .	124.9	125.1	125.7	124.2
Fuel oil and other household fuel commodities . . . . .	86.6	87.1	86.6	86.8
Gas (piped) and electricity . . . . .	121.6	121.9	123.0	122.1
Household furnishings and operation . . . . .	123.8	123.0	123.4	121.4
Housefurnishings . . . . .	111.7	111.1	111.5	111.2
Apparel and upkeep . . . . .	132.7	128.3	130.1	134.2
Apparel commodities . . . . .	129.5	124.8	126.7	131.2
Men's and boys' apparel . . . . .	126.8	123.4	124.5	128.4
Women's and girls' apparel . . . . .	126.9	121.1	123.5	131.1
Infants' and toddlers' apparel . . . . .	131.2	123.0	128.0	129.5
Footwear . . . . .	126.8	123.3	123.6	125.1
Apparel services . . . . .	157.4	157.2	157.3	156.3
Transportation . . . . .	138.8	140.1	139.2	135.9
Private transportation . . . . .	135.9	136.9	136.3	133.1
New vehicles . . . . .	140.0	140.3	140.0	137.5
Used cars . . . . .	156.5	157.5	157.0	145.4
Motor fuel . . . . .	99.8	103.6	101.1	103.7
Maintenance and repairs . . . . .	155.1	154.0	154.5	151.2
Other private transportation . . . . .	170.1	169.8	170.3	162.1
Public transportation . . . . .	176.1	181.8	177.1	171.7
Medical care . . . . .	222.1	220.8	221.6	212.8
Medical care commodities . . . . .	204.8	204.4	204.7	201.7
Medical care services . . . . .	226.1	224.6	225.6	215.4
Professional medical services . . . . .	202.4	201.6	202.0	194.0
Entertainment . . . . .	154.9	153.6	154.1	150.7
Entertainment commodities . . . . .	139.3	138.5	139.0	137.0
Entertainment services . . . . .	173.4	171.4	172.0	167.1
Other goods and services . . . . .	210.2	205.7	207.7	201.4
Personal care . . . . .	147.5	146.9	147.3	145.1
Toilet goods and personal care appliances . . . . .	143.0	142.7	143.2	141.8
Personal care services . . . . .	152.4	151.4	151.7	148.7
Personal and educational expenses . . . . .	240.7	233.3	236.3	228.0
School books and supplies . . . . .	216.9	212.9	213.1	208.4
Personal and educational services . . . . .	242.7	235.1	238.2	229.7

<sup>1</sup>Indexes on a December 1982 = 100 base.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

## Guidelines for Authors

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\*Indicates article was abstracted from another source.

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